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(71) Applicants (for all designated States except US): MIT-  
SUBISHI PHARMA CORPORATION [JP/JP]; 6-9, Hi-  
ranomachi 2-chome, Chuo-ku, Osaka-shi, Osaka 541-0046  
(JP). SANOFI-SYNTHELABO [FR/FR]; 174 AVENUE  
DE FRANCE, F-75013 PARIS (FR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): UEHARA, Fumiaki  
[JP/JP]; c/o MITSUBISHI PHARMA CORPORATION,  
TOKYO HEAD OFFICE, 2-6, Nihonbashi-honcho  
2-chome, Chuo-ku, Tokyo 103-8405 (JP). ARIT-  
OMO, Keiichi [JP/JP]; c/o MITSUBISHI PHARMA  
CORPORATION, TOKYO HEAD OFFICE, 2-6, Ni-  
honbashi-honcho 2-chome, Chuo-ku, Tokyo 103-8405  
(JP). SHODA, Aya [JP/JP]; c/o MITSUBISHI PHARMA  
CORPORATION, TOKYO HEAD OFFICE, 2-6, Nihon-  
bashi-honcho 2-chome, Chuo-ku, Tokyo 103-8405 (JP).  
HIKI, Shinsuke [JP/JP]; c/o MITSUBISHI PHARMA  
CORPORATION, TOKYO HEAD OFFICE, 2-6, Ni-  
honbashi-honcho 2-chome, Chuo-ku, Tokyo 103-8405

(JP). OKUYAMA, Masahiro [JP/JP]; c/o MITSUBISHI  
PHARMA CORPORATION, TOKYO HEAD OFFICE,  
2-6, Nihonbashi-honcho 2-chome, Chuo-ku, Tokyo  
103-8405 (JP). USUI, Yoshihiro [JP/JP]; c/o MIT-  
SUBISHI PHARMA CORPORATION, TOKYO HEAD  
OFFICE, 2-6, Nihonbashi-honcho 2-chome, Chuo-ku,  
Tokyo 103-8405 (JP). OOIIZUMI, Mitsuru [JP/JP]; c/o  
MITSUBISHI PHARMA CORPORATION, TOKYO  
HEAD OFFICE, 2-6, Nihonbashi-honcho 2-chome,  
Chuo-ku, Tokyo 103-8405 (JP). WATANABE, Kazutoshi  
[JP/JP]; c/o MITSUBISHI PHARMA CORPORATION,  
TOKYO HEAD OFFICE, 2-6, Nihonbashi-honcho  
2-chome, Chuo-ku, Tokyo 103-8405 (JP). YAMAKOSHI,  
Koichi [JP/JP]; c/o MITSUBISHI PHARMA CORPORA-  
TION, TOKYO HEAD OFFICE, 2-6, Nihonbashi-honcho  
2-chome, Chuo-ku, Tokyo 103-8405 (JP).

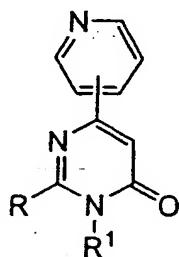
(74) Agent: SIKS & CO.; 8th Floor, Kyobashi-Nisshoku Bldg.,  
8-7, Kyobashi 1-chome, Chuo-ku, Tokyo 104-0031 (JP).

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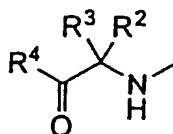
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[Continued on next page]

(54) Title: 3-SUBSTITUTED-4-PYRIMIDONE DERIVATIVES



(I)



(II)

R<sup>4</sup> represents a benzene ring which may be substituted, a naphthalene ring which may be substituted, an indan ring which may be substituted, a tetrahydronaphthalene ring which may be substituted, or an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom and nitrogen atom, and having 5 to 10 ring-constituting atoms in total.

(57) Abstract: A pyrimidone derivative represented by formula (I) or a salt thereof, or a solvate thereof or a hydrate thereof having inhibitory activity against tau protein kinase 1; wherein R<sup>1</sup> represents a C<sub>1</sub>-C<sub>12</sub> alkyl group which may be substituted; R represents, for example, a group represented by the following formula (II); wherein R<sup>2</sup> and R<sup>3</sup> independently represent a hydrogen atom or a C<sub>1</sub>-C<sub>8</sub> alkyl group;

WO 03/037888 A1



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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## DESCRIPTION

## 3-SUBSTITUTED-4-PYRIMIDONE DERIVATIVES

## Technical Field

The present invention relates to compounds that are useful as an active ingredient of a medicament for preventive and/or therapeutic treatment of diseases mainly caused by abnormal activity of tau protein kinase 1, such as neurodegenerative diseases (e.g. Alzheimer disease).

## Background Art

Alzheimer disease is progressive senile dementia, in which marked cerebral cortical atrophy is observed due to degeneration of nerve cells and decrease of nerve cell number. Pathologically, numerous senile plaques and neurofibrillary tangles are observed in brain. The number of patients has been increased with the increment of aged population, and the disease arises a serious social problem. Although various theories have been proposed, a cause of the disease has not yet been elucidated. Early resolution of the cause has been desired.

It has been known that the degree of appearance of two characteristic pathological changes of Alzheimer disease well correlates to the degree of intellectual dysfunction. Therefore, researches have been conducted from early 1980's to reveal the cause of the disease through molecular level investigations of components of the two pathological changes. Senile plaques accumulate extracellularly, and  $\beta$  amyloid protein has been elucidated as their main component (abbreviated as "A $\beta$ " hereinafter in the specification: Biochem. Biophys. Res. Commun., 120, 855 (1984); EMBO J., 4, 2757 (1985); Proc. Natl. Acad. Sci. USA, 82, 4245 (1985)). In the other pathological change, i.e., the neurofibrillary tangles, a double-helical filamentous

substance called paired helical filament (abbreviated as "PHF" hereinafter in the specification) accumulate intracellularly, and tau protein, which is a kind of microtubule-associated protein specific for brain, has been revealed as its main component (Proc. Natl. Acad. Sci. USA, 85, 4506 (1988); Neuron, 1, 827 (1988)).

Furthermore, on the basis of genetic investigations, presenilins 1 and 2 were found as causative genes of familial Alzheimer disease (Nature, 375, 754 (1995); Science, 269, 973 (1995); Nature, 376, 775 (1995)), and it has been revealed that presence of mutants of presenilins 1 and 2 promotes the secretion of A $\beta$  (Neuron, 17, 1005 (1996); Proc. Natl. Acad. Sci. USA, 94, 2025 (1997)). From these results, it is considered that, in Alzheimer disease, A $\beta$  abnormally accumulates and agglomerates due to a certain reason, which engages with the formation of PHF to cause death of nerve cells. It is also expected that extracellular outflow of glutamic acid and activation of glutamate receptor responding to the outflow may possibly be important factors in an early process of the nerve cell death caused by ischemic cerebrovascular accidents (Sai-shin Igaku [Latest Medicine], 49, 1506 (1994)).

It has been reported that kainic acid treatment that stimulates the AMPA receptor, one of glutamate receptor, increases mRNA of the amyloid precursor protein (abbreviated as "APP" hereinafter in the specification) as a precursor of A $\beta$  (Society for Neuroscience Abstracts, 17, 1445 (1991)), and also promotes metabolism of APP (The Journal of Neuroscience, 10, 2400 (1990)). Therefore, it has been strongly suggested that the accumulation of A $\beta$  is involved in cellular death due to ischemic cerebrovascular disorders. Other diseases in which abnormal accumulation and agglomeration of A $\beta$  are observed include, for example, Down syndrome, cerebral bleeding due to solitary cerebral amyloid angiopathy, Lewy body disease (Shin-kei Shinpo [Nerve Advance], 34, 343 (1990); Tanpaku-shitu Kaku-san Koso [Protein, Nucleic Acid, Enzyme], 41, 1476 (1996)) and the like. Furthermore, as diseases showing neurofibrillary tangles due to the PHF accumulation, examples include



progressive supranuclear palsy, subacute sclerosing panencephalitic parkinsonism, postencephalitic parkinsonism, pugilistic encephalitis, Guam parkinsonism-dementia complex, Lewy body disease and the like (Tanpakushitu Kakusan Koso [Protein, Nucleic Acid, Enzyme], 36, 2 (1991); Igaku no Ayumi [Progress of Medicine], 158, 511 (1991); Tanpakushitu Kakusan Koso [Protein, Nucleic Acid, Enzyme], 41, 1476 (1996)).

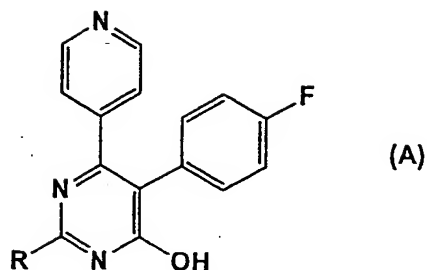
The tau protein is generally composed of a group of related proteins that forms several bands at molecular weights of 48-65 kDa in SDS-polyacrylamide gel electrophoresis, and it promotes the formation of microtubules. It has been verified that tau protein incorporated in the PHF in the brain suffering from Alzheimer disease is abnormally phosphorylated compared with usual tau protein (J. Biochem., 99, 1807 (1986); Proc. Natl. Acad. Sci. USA, 83, 4913 (1986)). An enzyme catalyzing the abnormal phosphorylation has been isolated. The protein was named as tau protein kinase 1 (abbreviated as "TPK1" hereinafter in the specification), and its physicochemical properties have been elucidated (Seikagaku [Biochemistry], 64, 308 (1992); J. Biol. Chem., 267, 10897 (1992)). Moreover, cDNA of rat TPK1 was cloned from a rat cerebral cortex cDNA library based on a partial amino acid sequence of TPK1, and its nucleotide sequence was determined and an amino acid sequence was deduced (Japanese Patent Un-examined Publication [Kokai] No. 6-239893/1994). As a result, it has been revealed that the primary structure of the rat TPK1 corresponds to that of the enzyme known as rat GSK-3  $\beta$  (glycogen synthase kinase 3  $\beta$ , FEBS Lett., 325, 167 (1993)).

It has been reported that A  $\beta$ , the main component of senile plaques, is neurotoxic (Science, 250, 279 (1990)). However, various theories have been proposed as for the reason why A  $\beta$  causes the cell death, and any authentic theory has not yet been established. Takashima et al. observed that the cell death was caused by A  $\beta$  treatment of fetal rat hippocampus primary culture system, and then found that the

TPK1 activity was increased by A  $\beta$  treatment and the cell death by A  $\beta$  was inhibited by antisense of TPK1 (Proc. Natl. Acad. Sci. USA, 90, 7789 (1993); Japanese Patent Un-examined Publication [Kokai] No. 6-329551/1994).

In view of the foregoing, compounds which inhibit the TPK1 activity may possibly suppress the neurotoxicity of A  $\beta$  and the formation of PHF and inhibit the nerve cell death in the Alzheimer disease, thereby cease or defer the progress of the disease. The compounds may also be possibly used as a medicament for therapeutic treatment of ischemic cerebrovascular disorder, Down syndrome, cerebral amyloid angiopathy, cerebral bleeding due to Lewy body disease and the like by suppressing the cytotoxicity of A  $\beta$ . Furthermore, the compounds may possibly be used as a medicament for therapeutic treatment of neurodegenerative diseases such as progressive supranuclear palsy, subacute sclerosing panencephalitic parkinsonism, postencephalitic parkinsonism, pugilistic encephalitis, Guam parkinsonism-dementia complex, Lewy body disease, Pick's disease, corticobasal degeneration, frontotemporal dementia, vascular dementia, traumatic injuries, brain and spinal cord trauma, peripheral neuropathies, retinopathies and glaucoma, as well as other diseases such as non-insulin dependent diabetes, obesity, manic depressive illness, schizophrenia, alopecia, breast cancer, non-small cell lung carcinoma, thyroid cancer, T or B-cell leukemia, and several virus-induced tumors.

As structurally similar compounds to the compounds of the present invention represented by formula (I) described later, compounds represented by the following formula (A) are known:



wherein R represents 2,6-dichlorobenzyl group, 2-(2-chlorophenyl)ethylamino group, 3-phenylpropylamino group, or 1-methyl-3-phenylpropylamino group (WO98/24782). The compounds represented by formula (A) are characterized to have 4-fluorophenyl group at the 5-position of the pyrimidine ring and a hydroxy group at the 4-position, and not falling within the scope of the present invention. Moreover, main pharmacological activity of the compounds represented by formula (A) is anti-inflammatory effect, whereas the compounds of the present invention represented by formula (I) are useful as a TPK1 inhibitor or a medicament for therapeutic treatment of neurodegenerative diseases, and therefore, their pharmacological activities are totally different to each other.

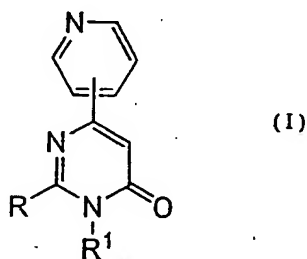
#### Object to be Achieved by the Invention

An object of the present invention is to provide compounds useful as an active ingredient of a medicament for preventive and/or therapeutic treatment of diseases such as Alzheimer disease. More specifically, the object is to provide novel compounds useful as an active ingredient of a medicament that enables radical prevention and/or treatment of the neurodegenerative diseases such as Alzheimer disease by inhibiting the TPK1 activity to suppress the neurotoxicity of A $\beta$  and the formation of the PHF and by inhibiting the death of nerve cells.

#### Means to Achieve the Object

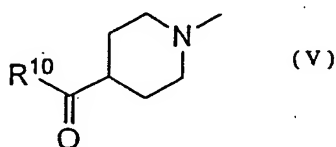
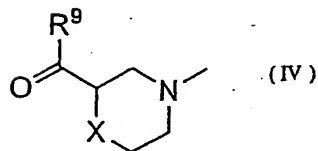
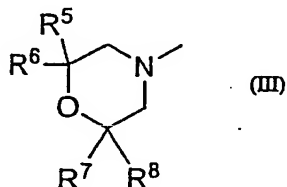
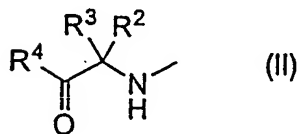
In order to achieve the foregoing object, the inventors of the present invention conducted screenings of various compounds having inhibitory activity against the phosphorylation of TPK1. As a result, they found that compounds represented by the following formula (I) had the desired activity and were useful as an active ingredient of a medicament for preventive and/or therapeutic treatment of the aforementioned diseases. The present invention was achieved on the basis of these findings.

The present invention thus provide a pyrimidone derivative represented by formula (I) or a salt thereof, or a solvate thereof or a hydrate thereof:



wherein R<sup>1</sup> represents a C<sub>1</sub>-C<sub>12</sub> alkyl group which may be substituted;

R represents any one of groups represented by the following formulas (II) to (V):



wherein  $R^2$  and  $R^3$  independently represent a hydrogen atom or a  $C_1-C_8$  alkyl group;  $R^4$  represents a benzene ring which may be substituted, a naphthalene ring which may be substituted, an indan ring which may be substituted, a tetrahydronaphthalene ring which may be substituted, or an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom and nitrogen atom, and having 5 to 10 ring-constituting atoms in total;

$R^5$  represents a  $C_1-C_8$  alkyl group which may be substituted, a  $C_3-C_8$  cycloalkyl group which may be substituted, a benzene ring which may be substituted, a naphthalene ring which may be substituted, an indan ring which may be substituted, a tetrahydronaphthalene ring which may be substituted, or an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom, and nitrogen atom, and having 5 to 10 ring-constituting atoms in total;

$R^6$  represents a hydrogen atom, a  $C_1-C_8$  alkyl group which may be substituted, a benzene ring which may be substituted;

or  $R^5$  and  $R^6$  may bind to each other to form together with the carbon to which  $R^5$  and  $R^6$  are attached an optionally substituted spiro carbocyclic ring having 3 to 11 ring-constituting atoms in total;

$R^7$  and  $R^8$  independently represent a hydrogen atom or a  $C_1-C_8$  alkyl group, or  $R^7$  and  $R^8$  may combine to each other to form a  $C_2-C_6$  alkylene group;

$R^9$  and  $R^{10}$  represent a  $C_1-C_8$  alkyl group which may be substituted, a  $C_3-C_8$  cycloalkyl group which may be substituted, a benzene ring which may be substituted, a naphthalene ring which may be substituted, an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom, and nitrogen atom, and having 5 to 10 ring-constituting atoms in total, or  $R^9$  and  $R^{10}$  represent  $-N(R^{11})(R^{12})$  wherein  $R^{11}$  represents a hydrogen atom, a  $C_1-C_8$

alkyl group; and  $R^{12}$  represents a  $C_1-C_8$  alkyl group, a benzene ring which may be substituted, a naphthalene ring which may be substituted, or an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom, and nitrogen atom, and having 5 to 10 ring-constituting atoms in total;  
and X represents  $CH_2$ , O or  $NR^{13}$  wherein  $R^{13}$  represents a hydrogen atom or a  $C_1-C_8$  alkyl group.

According to preferred embodiments of the present invention, provided are:

the aforementioned pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof, wherein  $R^1$  is methyl group;

the aforementioned pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof, wherein R is the group represented by formula (II);

the aforementioned pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof, wherein each of  $R^2$  and  $R^3$  is hydrogen atom;

the aforementioned pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof, wherein R is the group represented by formula (III);

the aforementioned pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof, wherein  $R^6$  is hydrogen atom;

the aforementioned pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof, wherein each of  $R^7$  and  $R^8$  is hydrogen atom;

the aforementioned pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof, wherein each of  $R^7$  and  $R^8$  is methyl group;

the aforementioned pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof, wherein R is the group represented by formula (IV);

the aforementioned pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof, wherein  $R^9$  is a benzene ring which may be substituted;

the aforementioned pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof, wherein X is CH<sub>2</sub>;

the aforementioned pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof, wherein X is O;

the aforementioned pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof, wherein R is the group represented by formula (V);

the aforementioned pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof, wherein R<sup>10</sup> is a benzene ring which may be substituted; and

the aforementioned pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof, wherein R<sup>10</sup> is a heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom, and nitrogen atom, and having total ring-constituting atoms of 5 to 10 which may be substituted.

From another aspect, the present invention provides a medicament comprising as an active ingredient a substance selected from the group consisting of the pyrimidone derivative represented by the aforementioned formula (I) and a salt thereof, and a solvate thereof and a hydrate thereof, and a tau protein kinase 1 inhibitor selected from the group consisting of the pyrimidone derivative represented by the aforementioned formula (I) and a salt thereof, and a solvate thereof and a hydrate thereof.

According to preferred embodiments of the aforementioned medicament, provided are the aforementioned medicament which is used for preventive and/or therapeutic treatment of a disease caused by tau protein kinase 1 hyperactivity;

the aforementioned medicament which is used for preventive and/or therapeutic treatment of a neurodegenerative disease;

the aforementioned medicament, wherein the disease is selected from the group consisting of Alzheimer disease, ischemic cerebrovascular accidents, Down

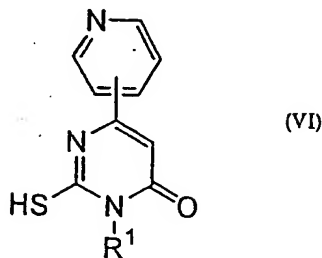
syndrome, cerebral bleeding due to cerebral amyloid angiopathy, progressive supranuclear palsy, subacute sclerosing panencephalitic parkinsonism, postencephalitic parkinsonism, pugilistic encephalitis, Guam parkinsonism-dementia complex, Lewy body disease, Pick's disease, corticobasal degeneration, frontotemporal dementia, vascular dementia, traumatic injuries, brain and spinal cord trauma, peripheral neuropathies, retinopathies and glaucoma; and

the aforementioned medicament, wherein the disease is selected from the group consisting of non-insulin dependent diabetes, obesity, manic depressive illness, schizophrenia, alopecia, breast cancer, non-small cell lung carcinoma, thyroid cancer, T or B-cell leukemia, and a virus-induced tumor.

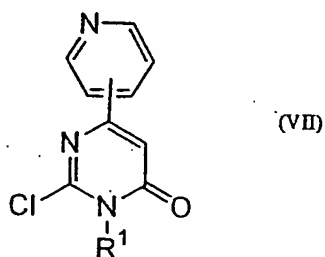
According to further aspects of the present invention, there are provided a method for preventive and/or therapeutic treatment of a disease caused by tau protein kinase 1 hyperactivity, which comprises the step of administering to a patient a preventively and/or therapeutically effective amount of a substance selected from the group consisting of the 3-substituted-4-pyrimidone derivative of formula (I) and the physiologically acceptable salt thereof, and the solvate thereof and the hydrate thereof; and a use of a substance selected from the group consisting of the 3-substituted-4-pyrimidone derivative of formula (I) and the physiologically acceptable salt thereof, and the solvate thereof and the hydrate thereof for the manufacture of the aforementioned medicament.

From further aspect of the present invention, provided are a pyrimidone derivative represented by formula (VI) or a salt thereof, or a solvate thereof or a hydrate thereof:





wherein R<sup>1</sup> represents a C<sub>1</sub>-C<sub>12</sub> alkyl group which may be substituted, and a pyrimidone derivative represented by formula (VII) or a salt thereof, or a solvate thereof or a hydrate thereof:



wherein R<sup>1</sup> represents a C<sub>1</sub>-C<sub>12</sub> alkyl group which may be substituted.

#### Best Mode for Carrying Out the Invention

The alkyl group used herein may be either linear or branched. The C<sub>1</sub>-C<sub>12</sub> alkyl group represented by R<sup>1</sup> may be, for example, methyl group, ethyl group, n-propyl group, isopropyl group, n-butyl group, isobutyl group, sec-butyl group, tert-butyl group, n-pentyl group, isopentyl group, neopentyl group, 1,1-dimethylpropyl group, n-hexyl group, isohexyl group, or a linear or branched heptyl group, octyl group, nonyl group, decyl group, undecyl group or dodecyl group. In the specification, when a functional group is defined as "which may be substituted" or "optionally substituted", the number of substituents as well as their types and substituting positions are not particularly limited, and when two or more substituents are present, they may be the same or different.

When the C<sub>1</sub>-C<sub>12</sub> alkyl group represented by R<sup>1</sup> has one or more substituents,

the alkyl group may have one or more substituents selected from the group consisting of a C<sub>1</sub>-C<sub>5</sub> alkoxy group such as methoxy group, ethoxy group, propoxy group, isopropoxy group, butoxy group, isobutoxy group, tert-butoxy group; amino group, C<sub>1</sub>-C<sub>3</sub> alkylamino group or C<sub>2</sub>-C<sub>6</sub> dialkylamino group; a C<sub>6</sub>-C<sub>10</sub> aryl group such as phenyl group, 1-naphthyl group, and 2-naphthyl group;

The C<sub>1</sub>-C<sub>8</sub> alkyl group represented by R<sup>2</sup> or R<sup>3</sup> may be, for example, methyl group, ethyl group, n-propyl group, isopropyl group, n-butyl group, isobutyl group, sec-butyl group, tert-butyl group, n-pentyl group, isopentyl group, neopentyl group, 1,1-dimethylpropyl group, n-hexyl group, isohexyl group, or a linear or branched heptyl group or octyl group.

When the benzene ring, the naphthalene ring, the indan ring, the tetrahydronaphthalene ring, or the heterocyclic ring represented by R<sup>4</sup> or R<sup>5</sup> has one or more substituents, the rings may have one or more substituents selected from the groups consisting of a C<sub>1</sub>-C<sub>5</sub> alkyl group such as methyl group, ethyl group, propyl group, isopropyl group, butyl group, isobutyl group, sec-butyl group, tert-butyl group, pentyl group, isopentyl group, neopentyl group, 1,1-dimethylpropyl group; C<sub>3</sub>-C<sub>6</sub> cycloalkyl group such as cyclopropyl group, cyclobutyl group, cyclopentyl group, cyclohexyl group; a C<sub>3</sub>-C<sub>6</sub> cycloalkyloxy group such as cyclopropyloxy group, cyclobutyloxy group, cyclopentyloxy group, cyclohexyloxy group; a C<sub>1</sub>-C<sub>5</sub> alkoxy group such as methoxy group, ethoxy group, propoxy group, isopropoxy group, butoxy group, isobutoxy group, tert-butoxy group, pentyloxy group, and isopentyloxy group; a C<sub>4</sub>-C<sub>7</sub> cycloalkylalkoxy group such as cyclopropylmethoxy group, cyclopentylmethoxy group; a C<sub>1</sub>-C<sub>5</sub> alkylthio group such as methylthio group, ethylthio group, propylthio group, butylthio group, and pentylthio group; a C<sub>1</sub>-C<sub>5</sub> alkylsulfonyl group such as methanesulfonyl group, ethanesulfonyl group, propanesulfonyl group, butanesulfonyl group, and pentanesulfonyl group; a halogen atom such as fluorine atom, chlorine atom, bromine atom, and iodine atom; a C<sub>1</sub>-C<sub>5</sub> halogenated alkyl group such as

trifluoromethyl group; a C<sub>1</sub>-C<sub>5</sub> halogenated alkoxy group such as trifluoromethoxy group, 2,2,2-trifluoroethoxy group; hydroxyl group; cyano group; nitro group; formyl group; a C<sub>2</sub>-C<sub>6</sub> alkylcarbonyl group such as acetyl group, propionyl group, butyryl group, and valeryl group; benzene ring which may be substituted, naphthalene ring which may be substituted, an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom and nitrogen atom, and having 5 to 10 ring-constituting atoms, phenoxy group which may be substituted or phenylamino group which may be substituted; amino group; a C<sub>1</sub>-C<sub>5</sub> monoalkylamino group such as methylamino group, ethylamino group, propylamino group, isopropylamino group, butylamino group, isobutylamino group, tert-butylamino group, pentylamino group, and isopentylamino group; a C<sub>2</sub>-C<sub>10</sub> dialkylamino group such as dimethylamino group, ethylmethylamino group, diethylamino group, methylpropylamino group, and diisopropylamino group; a C<sub>2</sub>-C<sub>10</sub> monoalkylaminomethyl group such as methylaminomethyl group, ethylaminomethyl group, propylaminomethyl group, isopropylaminomethyl group, butylaminomethyl group, isobutylaminomethyl group, tert-butylaminomethyl group, pentylaminomethyl group, isopentylaminomethyl group; a C<sub>3</sub>-C<sub>11</sub> dialkylaminomethyl group such as dimethylaminomethyl group, diethylaminomethyl group, ethylmethylaminomethyl group, methylpropylaminomethyl group; pyrrolidinylmethyl group; piperidinylmethyl group; morpholinomethyl group; piperazinylmethyl group; pyrrolylmethyl group; imidazolylmethyl group; pyrazolylmethyl group; and triazolylmethyl group.

When the benzene ring, the naphthalene ring, the indan ring, the tetrahydronaphthalene ring or the heterocyclic ring has one or more substituents, the substituent may further have one or more substituents selected from the group consisting of a C<sub>1</sub>-C<sub>5</sub> alkyl group such as methyl group, ethyl group, propyl group, isopropyl group, butyl group, isobutyl group, sec-butyl group, tert-butyl group, pentyl group, isopentyl group, neopentyl group, 1,1-dimethylpropyl group; C<sub>3</sub>-C<sub>6</sub> cycloalkyl

group such as cyclopropyl group, cyclobutyl group, cyclopentyl group, cyclohexyl group; a C<sub>3</sub>-C<sub>6</sub> cycloalkyloxy group such as cyclopropyloxy group, cyclobutyloxy group, cyclopentyloxy group, cyclohexyloxy group; a C<sub>1</sub>-C<sub>5</sub> alkoxy group such as methoxy group, ethoxy group, propoxy group, isopropoxy group, butoxy group, isobutoxy group, tert-butoxy group, pentyloxy group, and isopentyloxy group; a C<sub>4</sub>-C<sub>7</sub> cycloalkylalkoxy group such as cyclopropylmethoxy group, cyclopentylmethoxy group; a C<sub>1</sub>-C<sub>5</sub> alkylthio group such as methylthio group, ethylthio group, propylthio group, butylthio group, and pentylthio group; a C<sub>1</sub>-C<sub>5</sub> alkylsulfonyl group such as methanesulfonyl group, ethanesulfonyl group, propanesulfonyl group, butanesulfonyl group, and pentanesulfonyl group; a halogen atom such as fluorine atom, chlorine atom, bromine atom, and iodine atom; a C<sub>1</sub>-C<sub>5</sub> halogenated alkyl group such as trifluoromethyl group; a C<sub>1</sub>-C<sub>5</sub> halogenated alkoxy group such as trifluoromethoxy group, 2,2,2-trifluoroethoxy group; hydroxyl group; cyano group; nitro group; formyl group; a C<sub>2</sub>-C<sub>6</sub> alkylcarbonyl group such as acetyl group, propionyl group, butyryl group, and valeryl group; amino group; a C<sub>1</sub>-C<sub>5</sub> monoalkylamino group such as methylamino group, ethylamino group, propylamino group, isopropylamino group, butylamino group, isobutylamino group, tert-butylamino group, pentylamino group, and isopentylamino group; a C<sub>2</sub>-C<sub>10</sub> dialkylamino group such as dimethylamino group, ethylmethylamino group, diethylamino group, methylpropylamino group, and diisopropylamino group; a C<sub>2</sub>-C<sub>10</sub> monoalkylaminomethyl group such as methylaminomethyl group, ethylaminomethyl group, propylaminomethyl group, isopropylaminomethyl group, butylaminomethyl group, isobutylaminomethyl group, tert-butylaminomethyl group, pentylaminomethyl group, isopentylaminomethyl group; a C<sub>3</sub>-C<sub>11</sub> dialkylaminomethyl group such as dimethylaminomethyl group, diethylaminomethyl group, ethylmethylaminomethyl group, methylpropylaminomethyl group and the like.

The heterocyclic ring having 1 to 4 hetero atoms selected from the group

consisting of oxygen atom, sulfur atom, and nitrogen atom, and having 5 to 10 ring-constituting atoms represented by  $R^4$  or  $R^5$  may be, for example, furan ring, dihydrofuran ring, tetrahydrofuran ring, pyran ring, dihydropyran ring, tetrahydropyran ring, benzofuran ring, dihydrobenzofuran, isobenzofuran ring, benzodioxole ring, chromene ring, chroman ring, isochroman ring, thiophene ring, benzothiophene ring, pyrrole ring, pyrroline ring, pyrrolidine ring, imidazole ring, imidazoline ring, imidazolidine ring, pyrazole ring, pyrazoline ring, pyrazolidine ring, triazole ring, tetrazole ring, pyridine ring, pyridine oxide ring, piperidine ring, pyrazine ring, piperazine ring, pyrimidine ring, pyridazine ring, indole ring, indoline ring, isoindole ring, isoindoline ring, indazole ring, benzimidazole ring, benzotriazole ring, tetrahydroisoquinoline ring, benzothiazolinone ring, benzoxazolinone ring, purine ring, quinolizine ring, quinoline ring, phthalazine ring, naphthyridine ring, quinoxaline ring, quinazoline ring, cinnoline ring, pteridine ring, oxazole ring, oxazolidine ring, isoxazole ring, isoxazolidine ring, oxadiazole ring, thiazole ring, benzothiazole ring, thiazylidine ring, isothiazole ring, isothiazolidine ring, benzodioxole ring, dioxane ring, benzodioxane ring, dithian ring, morpholine ring, thiomorpholine ring, and phthalimide ring.

The  $C_1$ - $C_8$  alkyl group represented by  $R^5$ ,  $R^6$ ,  $R^7$  or  $R^8$  may be, for example, methyl group, ethyl group, n-propyl group, isopropyl group, n-butyl group, isobutyl group, sec-butyl group, tert-butyl group, n-pentyl group, isopentyl group, neopentyl group, 1,1-dimethylpropyl group, n-hexyl group, isohexyl group, or a linear or branched heptyl group or octyl group.

The  $C_3$ - $C_8$  cycloalkyl group represented by  $R^5$  may be, for example, cyclopropyl group, cyclobutyl group, cyclopentyl group, cyclohexyl group, cycloheptyl group or cyclooctyl group.

When the  $C_1$ - $C_8$  alkyl group or  $C_3$ - $C_8$  cycloalkyl group represented by  $R^5$  or the  $C_1$ - $C_8$  alkyl group represented by  $R^6$  has one or more substituents, the group may

have one or more substituents selected from the groups consisting of a halogen atom, a C<sub>1</sub>-C<sub>6</sub> alkoxy group, a C<sub>3</sub>-C<sub>8</sub> cycloalkyl group, a benzene ring which may be substituted, a naphthalene ring which may be substituted, phenoxy group which may be substituted or phenylamino group which may be substituted; amino group, a C<sub>1</sub>-C<sub>6</sub> alkylamino group, a C<sub>2</sub>-C<sub>12</sub> dialkylamino group, 1-pyrrolidinyl group, 1-piperidinyl group, 1-morpholinyl group, 1-(tetrahydro-1,2,3,4-quinolinyl) group, or 1-(tetrahydro-1,2,3,4-isoquinolinyl) group.

When the benzene ring represented by R<sup>5</sup> has one or more substituents, the ring may have one or more substituents selected from the group consisting of a C<sub>1</sub>-C<sub>6</sub> alkyl group such as methyl group, ethyl group, propyl group, isopropyl group, butyl group, isobutyl group, sec-butyl group, tert-butyl group, pentyl group, isopentyl group, neopentyl group, 1,1-dimethylpropyl group; a C<sub>3</sub>-C<sub>6</sub> cycloalkyl group such as cyclopropyl group, cyclobutyl group, cyclopentyl group, cyclohexyl group; a C<sub>3</sub>-C<sub>6</sub> cycloalkyloxy group such as cyclopropyloxy group, cyclobutyloxy group, cyclopentyloxy group, cyclohexyloxy group; a C<sub>1</sub>-C<sub>5</sub> alkoxy group such as methoxy group, ethoxy group, propoxy group, isopropoxy group, butoxy group, isobutoxy group, tert-butoxy group, pentyloxy group, and isopentyloxy group; a C<sub>4</sub>-C<sub>7</sub> cycloalkylalkoxy group such as cyclopropylmethoxy group, cyclopentylmethoxy group; a C<sub>1</sub>-C<sub>5</sub> alkylthio group such as methylthio group, ethylthio group, propylthio group, butylthio group, and pentylthio group; a C<sub>1</sub>-C<sub>5</sub> alkylsulfonyl group such as methanesulfonyl group, ethanesulfonyl group, propanesulfonyl group, butanesulfonyl group, and pentanesulfonyl group; a halogen atom such as fluorine atom, chlorine atom, bromine atom, and iodine atom; a C<sub>1</sub>-C<sub>5</sub> halogenated alkyl group such as trifluoromethyl group; a C<sub>1</sub>-C<sub>5</sub> halogenated alkoxy group such as trifluoromethoxy group, 2,2,2-trifluoroethoxy group; hydroxyl group; cyano group; nitro group; formyl group; a C<sub>2</sub>-C<sub>6</sub> alkylcarbonyl group such as acetyl group, propionyl group, butyryl group, and valeryl group; a benzene ring which may be substituted, a naphthalene ring which

may be substituted, an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom and nitrogen atom, and having 5 to 10 ring-constituting atoms, phenoxy group which may be substituted or phenylamino group which may be substituted; amino group; a C<sub>1</sub>-C<sub>5</sub> monoalkylamino group such as methylamino group, ethylamino group, propylamino group, isopropylamino group, butylamino group, isobutylamino group, tert-butylamino group, pentylamino group, and isopentylamino group; a C<sub>2</sub>-C<sub>10</sub> dialkylamino group such as dimethylamino group, ethylmethylamino group, diethylamino group, methylpropylamino group, and diisopropylamino group; a C<sub>2</sub>-C<sub>10</sub> monoalkylaminomethyl group such as methylaminomethyl group, ethylaminomethyl group, propylaminomethyl group, isopropylaminomethyl group, butylaminomethyl group, isobutylaminomethyl group, tert-butylaminomethyl group, pentylaminomethyl group, isopentylaminomethyl group; a C<sub>3</sub>-C<sub>11</sub> dialkylaminomethyl group such as dimethylaminomethyl group, diethylaminomethyl group, ethylmethylaminomethyl group, methylpropylaminomethyl group; pyrrolidinylmethyl group; piperidinylmethyl group; morpholinomethyl group; piperazinylmethyl group; pyrrolylmethyl group; imidazolylmethyl group; pyrazolylmethyl group; triazolylmethyl group.

When the benzene ring represented by R<sup>6</sup> has one or more substituents, the substituent may further have one or more substituents selected from the groups consisting of a C<sub>1</sub>-C<sub>5</sub> alkyl group such as methyl group, ethyl group, propyl group, isopropyl group, butyl group, isobutyl group, sec-butyl group, tert-butyl group, pentyl group, isopentyl group, neopentyl group, 1,1-dimethylpropyl group; C<sub>3</sub>-C<sub>6</sub> cycloalkyl group such as cyclopropyl group, cyclobutyl group, cyclopentyl group, cyclohexyl group; a C<sub>3</sub>-C<sub>6</sub> cycloalkyloxy group such as cyclopropyloxy group, cyclobutyloxy group, cyclopentyloxy group, cyclohexyloxy group; a C<sub>1</sub>-C<sub>5</sub> alkoxy group such as methoxy group, ethoxy group, propoxy group, isopropoxy group, butoxy group, isobutoxy group, tert-butoxy group, pentyloxy group, and isopentyloxy group; a C<sub>4</sub>-C<sub>7</sub> cycloalkylalkoxy

group such as cyclopropylmethoxy group, cyclopentylmethoxy group; a C<sub>1</sub>-C<sub>5</sub> alkylthio group such as methylthio group, ethylthio group, propylthio group, butylthio group, and pentylthio group; a C<sub>1</sub>-C<sub>5</sub> alkylsulfonyl group such as methanesulfonyl group, ethanesulfonyl group, propanesulfonyl group, butanesulfonyl group, and pentanesulfonyl group; a halogen atom such as fluorine atom, chlorine atom, bromine atom, and iodine atom; a C<sub>1</sub>-C<sub>5</sub> halogenated alkyl group such as trifluoromethyl group; a C<sub>1</sub>-C<sub>5</sub> halogenated alkoxy group such as trifluoromethoxy group, 2,2,2-trifluoroethoxy group; hydroxyl group; cyano group; nitro group; formyl group; a C<sub>2</sub>-C<sub>6</sub> alkylcarbonyl group such as acetyl group, propionyl group, butyryl group, and valeryl group; amino group; a C<sub>1</sub>-C<sub>5</sub> monoalkylamino group such as methylamino group, ethylamino group, propylamino group, isopropylamino group, butylamino group, isobutylamino group, tert-butylamino group, pentylamino group, and isopentylamino group; a C<sub>2</sub>-C<sub>10</sub> dialkylamino group such as dimethylamino group, ethylmethylamino group, diethylamino group, methylpropylamino group, and diisopropylamino group; a C<sub>2</sub>-C<sub>10</sub> monoalkylaminomethyl group such as methylaminomethyl group, ethylaminomethyl group, propylaminomethyl group, isopropylaminomethyl group, butylaminomethyl group, isobutylaminomethyl group, tert-butylaminomethyl group, pentylaminomethyl group, isopentylaminomethyl group; a C<sub>3</sub>-C<sub>11</sub> dialkylaminomethyl group such as dimethylaminomethyl group, diethylaminomethyl group, ethylmethylaminomethyl group, methylpropylaminomethyl group.

When R<sup>5</sup> and R<sup>6</sup> combine to each other to form a spiro carbocyclic ring, together with the carbon atom to which R<sup>5</sup> and R<sup>6</sup> bind, the carbocyclic ring may be, for example, cyclopropyl ring, cyclobutyl ring, cyclopentyl ring, cyclohexyl ring, cycloheptyl ring, tetrahydrobenzocycloheptene ring, tetrahydronaphthalene ring, indane ring, bicyclo[4,2,0]octa-1,3,5-triene ring.

The C<sub>1</sub>-C<sub>8</sub> alkyl group represented by R<sup>9</sup>, R<sup>10</sup>, R<sup>11</sup>, R<sup>12</sup> or R<sup>13</sup> may be, for



example, methyl group, ethyl group, n-propyl group, isopropyl group, n-butyl group, isobutyl group, sec-butyl group, tert-butyl group, n-pentyl group, isopentyl group, neopentyl group, 1,1-dimethylpropyl group, n-hexyl group, isohexyl group, or a linear or branched heptyl group or octyl group.

The C<sub>3</sub>-C<sub>8</sub> cycloalkyl group represented by R<sup>9</sup> or R<sup>10</sup> may be, for example, cyclopropyl group, cyclobutyl group, cyclopentyl group, cyclohexyl group, cycloheptyl group or cyclooctyl group.

When the C<sub>1</sub>-C<sub>8</sub> alkyl group or C<sub>3</sub>-C<sub>8</sub> cycloalkyl group represented by R<sup>9</sup> or R<sup>10</sup> has one or more substituents, the group may have one or more substituents selected from, for example, the groups consisting of a halogen atom, C<sub>3</sub>-C<sub>8</sub> cycloalkyl group, a benzene ring which may be substituted, a naphthalene ring which may be substituted, an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom and nitrogen atom, and having 5 to 10 ring-constituting atoms in total.

When the benzene ring, the naphthalene ring or the heterocyclic ring represented by R<sup>9</sup> or R<sup>10</sup> has one or more substituents, the ring may have one or more substituents selected from the group consisting of a C<sub>1</sub>-C<sub>5</sub> alkyl group such as methyl group, ethyl group, propyl group, isopropyl group, butyl group, isobutyl group, sec-butyl group, tert-butyl group, pentyl group, isopentyl group, neopentyl group, 1,1-dimethylpropyl group; C<sub>3</sub>-C<sub>6</sub> cycloalkyl group such as cyclopropyl group, cyclobutyl group, cyclopentyl group, cyclohexyl group; a C<sub>3</sub>-C<sub>6</sub> cycloalkyloxy group such as cyclopropyloxy group, cyclobutyloxy group, cyclopentyloxy group, cyclohexyloxy group; a C<sub>1</sub>-C<sub>5</sub> alkoxy group such as methoxy group, ethoxy group, propoxy group, isopropoxy group, butoxy group, isobutoxy group, tert-butoxy group, pentyloxy group, and isopentyloxy group; a C<sub>4</sub>-C<sub>7</sub> cycloalkylalkoxyl group such as cyclopropylmethoxy group, cyclopentylmethoxy group; a C<sub>1</sub>-C<sub>5</sub> alkylthio group such as methylthio group, ethylthio group, propylthio group, butylthio group, and pentylthio group; a C<sub>1</sub>-C<sub>5</sub>

alkylsulfonyl group such as methanesulfonyl group, ethanesulfonyl group, propanesulfonyl group, butanesulfonyl group, and pentanesulfonyl group; a halogen atom such as fluorine atom, chlorine atom, bromine atom, and iodine atom; a C<sub>1</sub>-C<sub>5</sub> halogenated alkyl group such as trifluoromethyl group; a C<sub>1</sub>-C<sub>5</sub> halogenated alkoxy group such as trifluoromethoxy group, 2,2,2-trifluoroethoxy group; hydroxyl group; cyano group; nitro group; formyl group; a C<sub>2</sub>-C<sub>6</sub> alkylcarbonyl group such as acetyl group, propionyl group, butyryl group, and valeryl group; a benzene ring which may be substituted, a naphthalene ring which may be substituted, an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom and nitrogen atom, and having 5 to 10 ring-constituting atoms in total; a phenoxy group which may be substituted; a phenylamino group which may be substituted; an amino group; a C<sub>1</sub>-C<sub>5</sub> monoalkylamino group such as methylamino group, ethylamino group, propylamino group, isopropylamino group, butylamino group, isobutylamino group, tert-butylamino group, pentylamino group, and isopentylamino group; a C<sub>2</sub>-C<sub>10</sub> dialkylamino group such as dimethylamino group, ethylmethylamino group, diethylamino group, methylpropylamino group, and diisopropylamino group; a C<sub>1</sub>-C<sub>5</sub> monoalkylaminomethyl group such as methylaminomethyl group, ethylaminomethyl group, propylaminomethyl group, isopropylaminomethyl group, butylaminomethyl group, isobutylaminomethyl group, tert-butylaminomethyl group, pentylaminomethyl group, isopentylaminomethyl group; a C<sub>2</sub>-C<sub>10</sub> dialkylaminomethyl group such as dimethylaminomethyl group, diethylaminomethyl group, ethylmethylaminomethyl group, methylpropylaminomethyl group; pyrrolidinylmethyl group; piperidinylmethyl group; morpholinomethyl group; piperazinylmethyl group; pyrrolylmethyl group; imidazolylmethyl group; pyrazolylmethyl group; and triazolylmethyl group.

The heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom, and nitrogen atom, and having 5 to 10

ring-constituting atoms in total represented by  $R^9$  or  $R^{10}$  may be, for example, furan ring, dihydrofuran ring, tetrahydrofuran ring, pyran ring, dihydropyran ring, tetrahydropyran ring, benzofuran ring, dihydrobenzofuran, isobenzofuran ring, benzodioxol ring, chromene ring, chroman ring, isochroman ring, thiophene ring, benzothiophene ring, pyrrole ring, pyrroline ring, pyrrolidine ring, imidazole ring, imidazoline ring, imidazolidine ring, pyrazole ring, pyrazoline ring, pyrazolidine ring, triazole ring, tetrazole ring, pyridine ring, pyridine oxide ring, piperidine ring, pyrazine ring, piperazine ring, pyrimidine ring, pyridazine ring, indole ring, indoline ring, isoindole ring, isoindoline ring, indazole ring, benzimidazole ring, benzotriazole ring, tetrahydroisoquinoline ring, benzothiazolinone ring, benzoxazolinone ring, purine ring, quinolizine ring, quinoline ring, phthalazine ring, naphthyridine ring, quinoxaline ring, quinazoline ring, cinnoline ring, pteridine ring, oxazole ring, oxazolidine ring, isoxazole ring, isoxazolidine ring, oxadiazole ring, thiazole ring, benzothiazole ring, thiazylidine ring, isothiazole ring, isothiazolidine ring, benzodioxole ring, dioxane ring, benzodioxane ring, dithian ring, morpholine ring, thiomorpholine ring, or phthalimide ring.

When the benzene ring, the naphthalene ring, or the heterocyclic ring represented by  $R^{12}$  has one or more substituents, the ring may be substituted by one or more substituents selected from the groups consisting of halogen atoms, a  $C_1-C_5$  alkyl group, a  $C_3-C_6$  cycloalkyl group, a  $C_3-C_6$  cycloalkyloxy group, a  $C_1-C_5$  alkoxy group, a  $C_4-C_7$  cycloalkylalkoxy, a  $C_1-C_5$  alkylthio group, a  $C_1-C_5$  alkylsulfonyl group, a  $C_1-C_5$  halogenated alkyl, and a benzene ring.

When the benzene ring, the naphthalene ring or the heterocyclic ring has one or more substituents, the substituent may further have one or more substituents selected from the group consisting of a  $C_1-C_5$  alkyl group such as methyl group, ethyl group, propyl group, isopropyl group, butyl group, isobutyl group, sec-butyl group, tert-butyl group, pentyl group, isopentyl group, neopentyl group, 1,1-dimethylpropyl

group; C<sub>3</sub>-C<sub>6</sub> cycloalkyl group such as cyclopropyl group, cyclobutyl group, cyclopentyl group, cyclohexyl group; a C<sub>3</sub>-C<sub>6</sub> cycloalkyloxy group such as cyclopropyloxy group, cyclobutyloxy group, cyclopentyloxy group, cyclohexyloxy group; a C<sub>1</sub>-C<sub>5</sub> alkoxy group such as methoxy group, ethoxy group, propoxy group, isopropoxy group, butoxy group, isobutoxy group, tert-butoxy group, pentyloxy group, and isopentyloxy group; a C<sub>4</sub>-C<sub>7</sub> cycloalkylalkoxy group such as cyclopropylmethoxy group, cyclopentylmethoxy group; a C<sub>1</sub>-C<sub>5</sub> alkylthio group such as methylthio group, ethylthio group, propylthio group, butylthio group, and pentylthio group; a C<sub>1</sub>-C<sub>5</sub> alkylsulfonyl group such as methanesulfonyl group, ethanesulfonyl group, propanesulfonyl group, butanesulfonyl group, and pentanesulfonyl group; a halogen atom such as fluorine atom, chlorine atom, bromine atom, and iodine atom; a C<sub>1</sub>-C<sub>5</sub> halogenated alkyl group such as trifluoromethyl group; a C<sub>1</sub>-C<sub>5</sub> halogenated alkoxy group such as trifluoromethoxy group, 2,2,2-trifluoroethoxy group; hydroxyl group; cyano group; nitro group; formyl group; a C<sub>2</sub>-C<sub>6</sub> alkylcarbonyl group such as acetyl group, propionyl group, butyryl group, and valeryl group; amino group; a C<sub>1</sub>-C<sub>5</sub> monoalkylamino group such as methylamino group, ethylamino group, propylamino group, isopropylamino group, butylamino group, isobutylamino group, tert-butylamino group, pentylamino group, and isopentylamino group; a C<sub>2</sub>-C<sub>10</sub> dialkylamino group such as dimethylamino group, ethylmethylamino group, diethylamino group, methylpropylamino group, and diisopropylamino group; a C<sub>2</sub>-C<sub>10</sub> monoalkylaminomethyl group such as methylaminomethyl group, ethylaminomethyl group, propylaminomethyl group, isopropylaminomethyl group, butylaminomethyl group, isobutylaminomethyl group, tert-butylaminomethyl group, pentylaminomethyl group, isopentylaminomethyl group; a C<sub>3</sub>-C<sub>11</sub> dialkylaminomethyl group such as dimethylaminomethyl group, diethylaminomethyl group, ethylmethylaminomethyl group, methylpropylaminomethyl group and the like.

R<sup>1</sup> may preferably be a C<sub>1</sub>-C<sub>3</sub> alkyl group, more preferably a methyl group.

R<sup>2</sup> may preferably be a hydrogen atom.

R<sup>3</sup> may preferably be a hydrogen atom.

R<sup>4</sup> may preferably be a benzene ring which may be substituted.

R<sup>5</sup> may preferably be a benzene ring or a naphthalene ring which may be substituted.

R<sup>6</sup> may preferably be a hydrogen atom.

R<sup>7</sup> and R<sup>8</sup> may preferably be a hydrogen atom or a C<sub>1</sub>-C<sub>3</sub> alkyl group.

R<sup>9</sup> or R<sup>10</sup> may preferably be a benzene ring which may be substituted.

R<sup>10</sup> may preferably be a heterocyclic ring having 1-4 hetero atoms selected oxygen atom, sulfur atom and nitrogen atom, and having total ring-constituting atoms of 5-10 which may be substituted. Particularly preferred R<sup>10</sup> is a benzene ring which may be substituted, a 2,3-dihydroindole ring which may be substituted, or 3,4-dihydro-2H-quinoline ring which may be substituted.

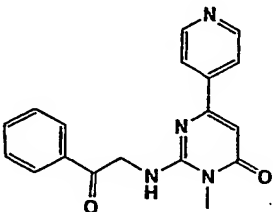
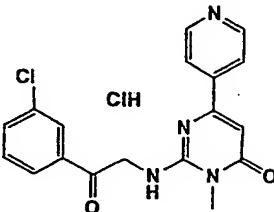
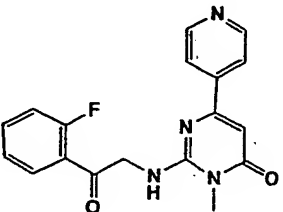
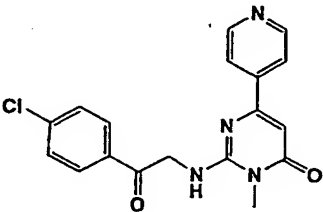
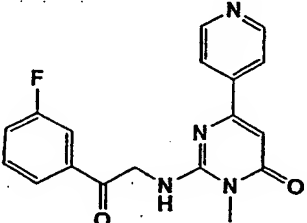
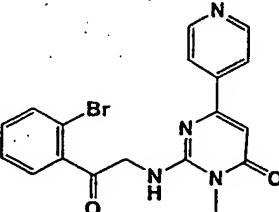
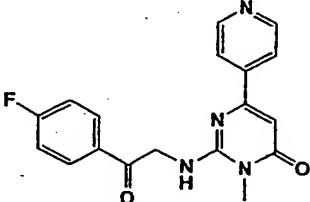
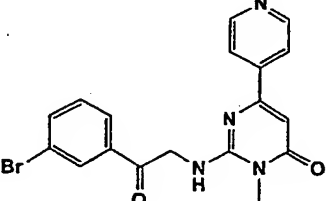
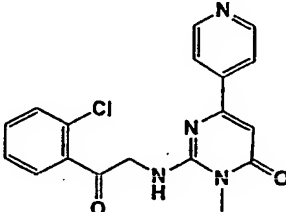
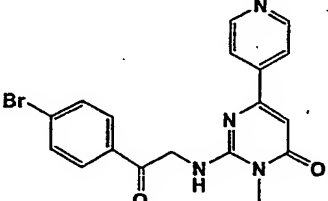
Particularly preferred X is CH<sub>2</sub> or O.

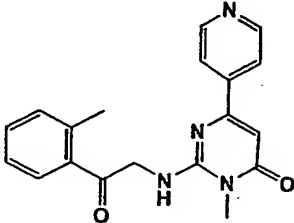
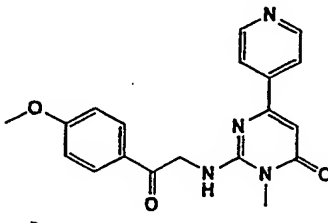
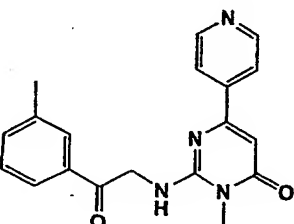
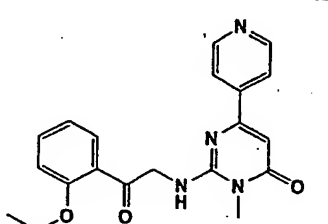
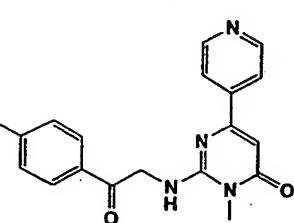
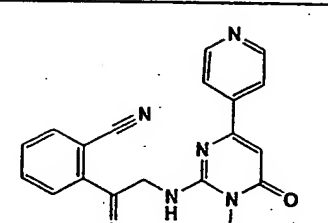
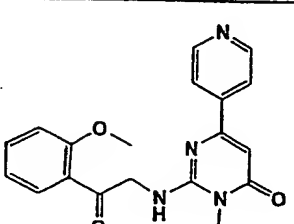
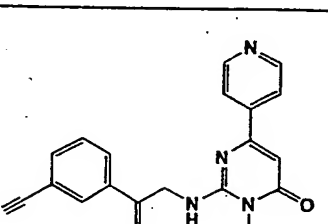
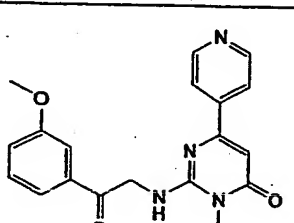
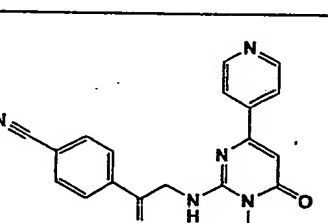
The compounds represented by the aforementioned formula (I) may form a salt. Examples of the salt include, when an acidic group exists, salts of alkali metals and alkaline earth metals such as lithium, sodium, potassium, magnesium, and calcium; salts of ammonia and amines such as methylamine, dimethylamine, trimethylamine, dicyclohexylamine, tris(hydroxymethyl)aminomethane, N,N-bis(hydroxyethyl)piperazine, 2-amino-2-methyl-1-propanol, ethanolamine, N-methylglucamine, and L-glucamine; or salts with basic amino acids such as lysine,  $\delta$ -hydroxylysine, and arginine. When a basic group exists, examples include salts with mineral acids such as hydrochloric acid, hydrobromic acid, sulfuric acid, nitric acid, phosphoric acid; salts with organic acids such as methanesulfonic acid, benzenesulfonic acid, p-toluenesulfonic acid, acetic acid, propionic acid, tartaric acid, fumaric acid, maleic acid, malic acid, oxalic acid, succinic acid, citric acid, benzoic acid, mandelic acid, cinnamic acid, lactic acid, glycolic acid, glucuronic acid, ascorbic acid,

nicotinic acid, and salicylic acid; or salts with acidic amino acids such as aspartic acid, and glutamic acid.

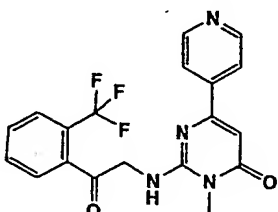
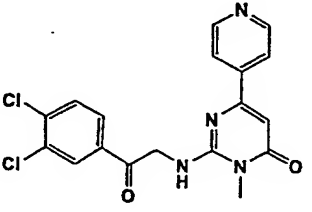
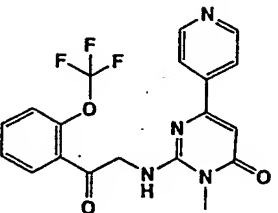
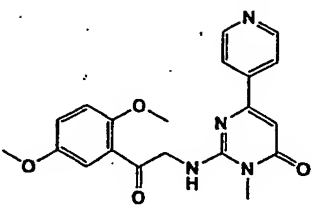
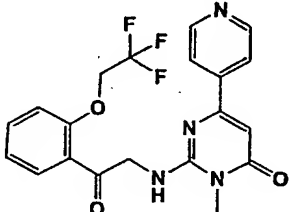
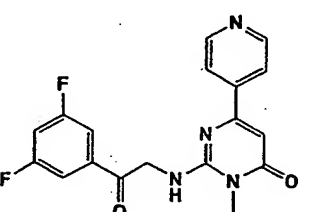
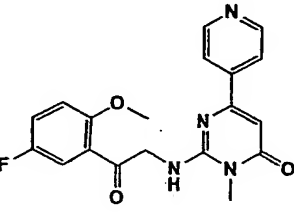
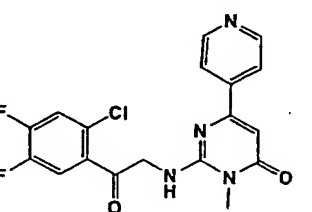
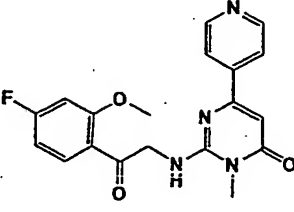
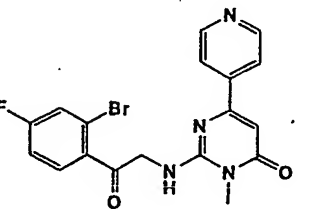
In addition to the 3-substituted-4-pyrimidone derivatives represented by the aforementioned formula (I) and salts thereof, their solvates and hydrates also fall within the scope of the present invention. The 3-substituted-4-pyrimidone derivatives represented by the aforementioned formula (I) may have one or more asymmetric carbon atoms. As for the stereochemistry of such asymmetric carbon atoms, they may independently be in either (R) and (S) configuration, and the pyrimidone derivative may exist as stereoisomers such as optical isomers, or diastereoisomers. Any stereoisomers of pure form, any mixtures of stereoisomers, racemates and the like fall within the scope of the present invention.

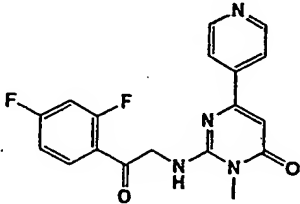
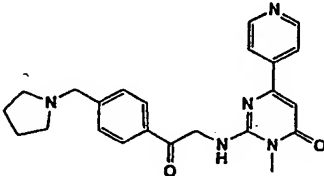
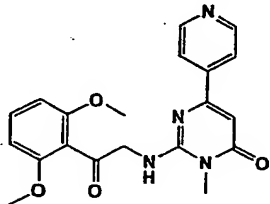
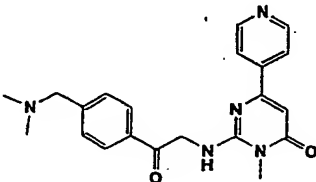
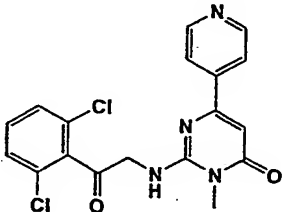
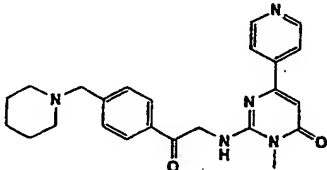
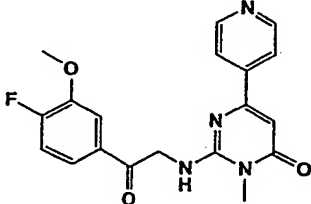
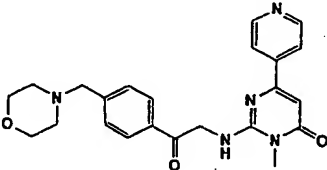
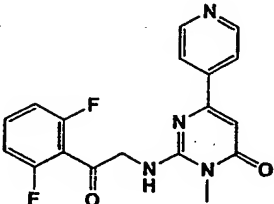
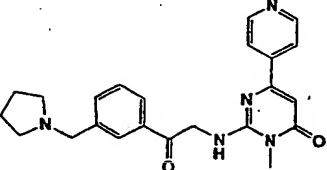
Examples of preferred compounds of the present invention are shown in the table below. However, the scope of the present invention is not limited by the following compounds.

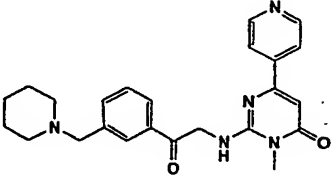
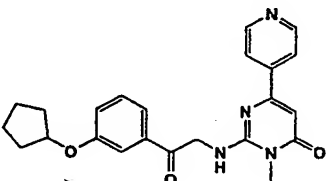
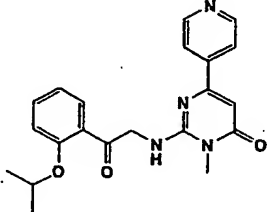
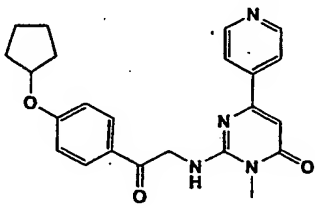
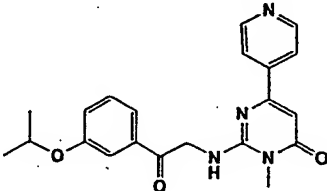
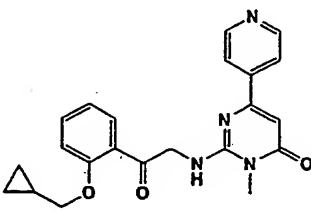
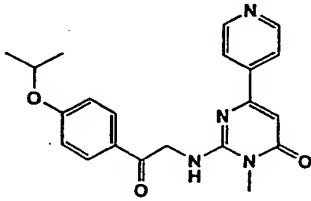
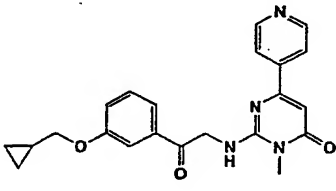
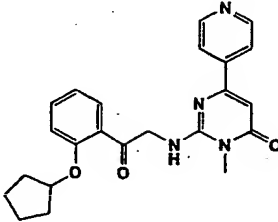
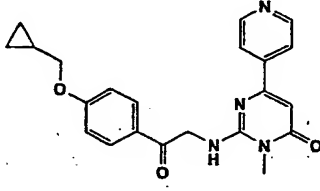
Compound No.	STRUCTURE	Compound No.	STRUCTURE
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A002		A007	
A003		A008	
A004		A009	
A005		A010	

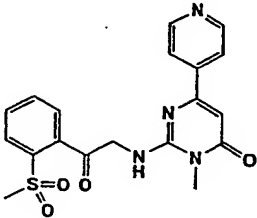
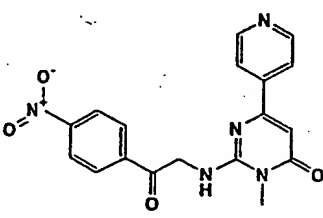
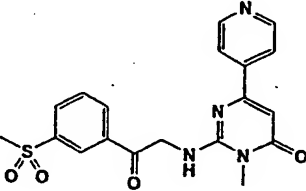
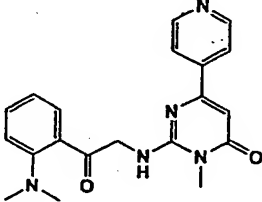
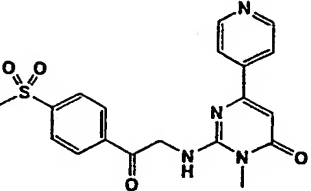
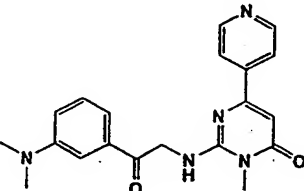
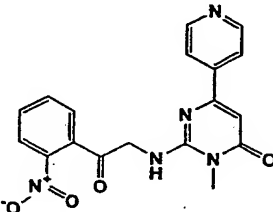
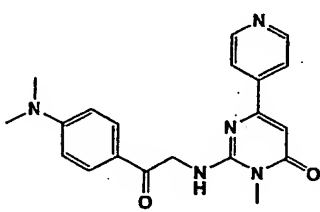
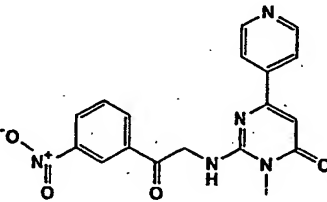
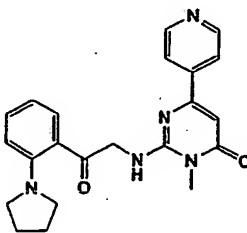
Compound No.	STRUCTURE	Compound No.	STRUCTURE
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A012		A017	
A013		A018	
A014		A019	
A015		A020	

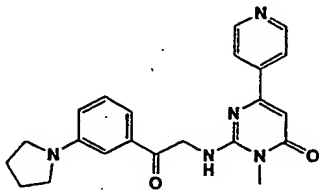
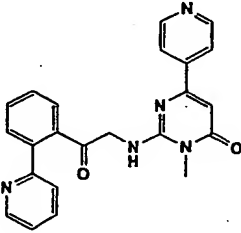
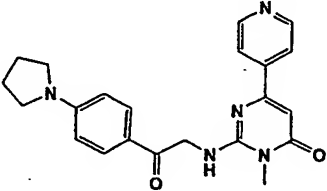
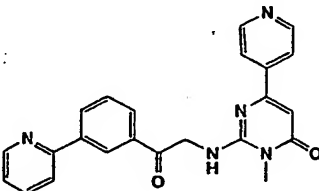
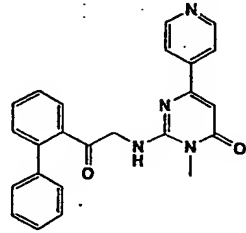
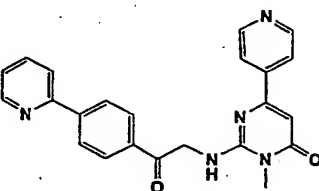
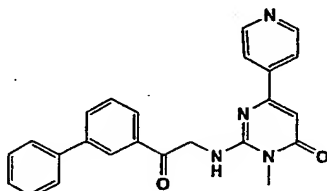
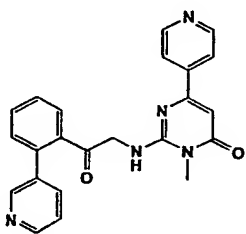
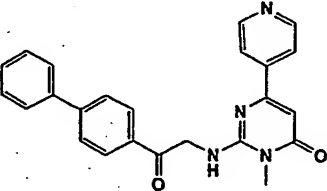
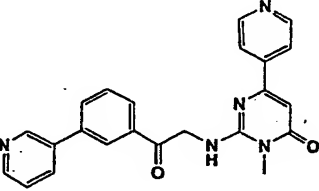


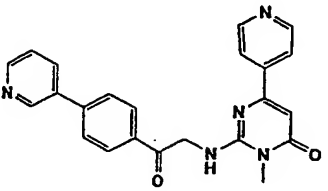
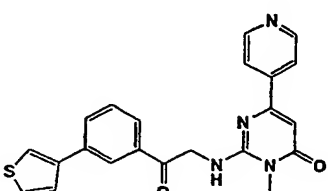
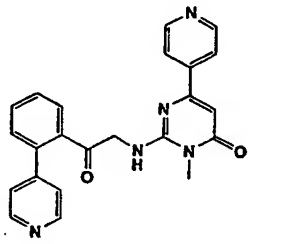
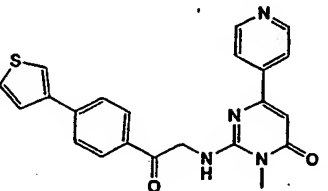
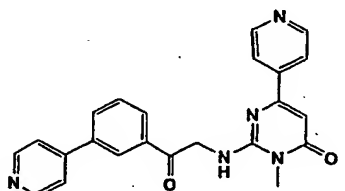
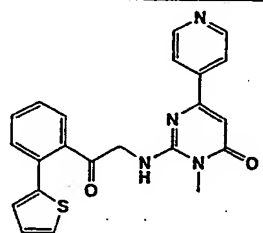
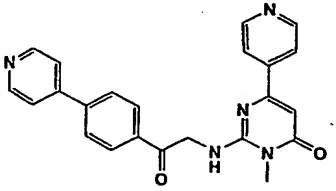
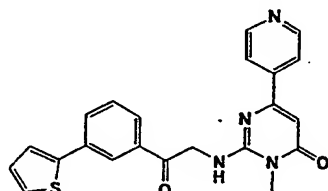
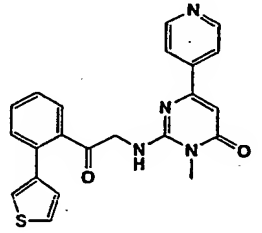
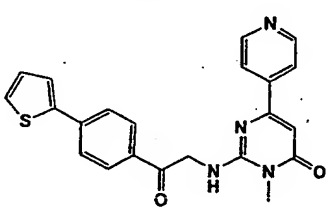
Compound No.	STRUCTURE	Compound No.	STRUCTURE
A021		A026	
A022		A027	
A023		A028	
A024		A029	
A025		A030	

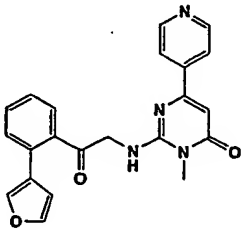
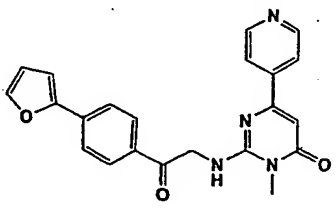
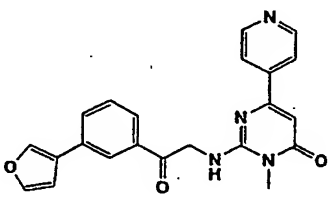
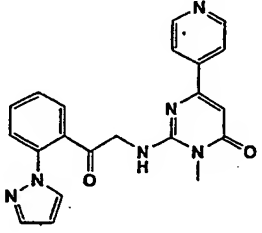
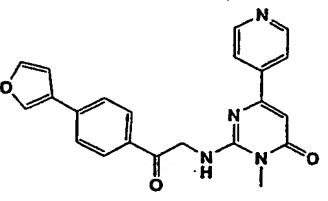
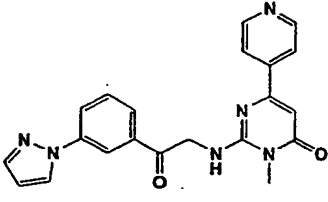
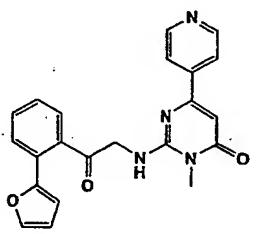
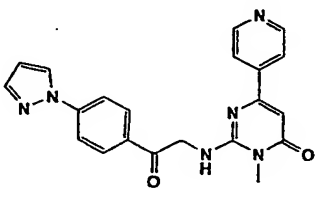
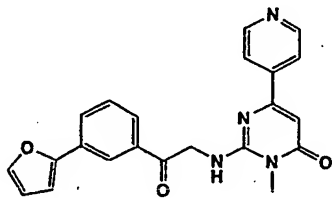
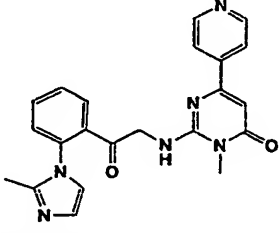
Compound No.	STRUCTURE	Compound No.	STRUCTURE
A031		A036	
A032		A037	
A033		A038	
A034		A039	
A035		A040	

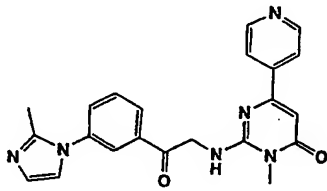
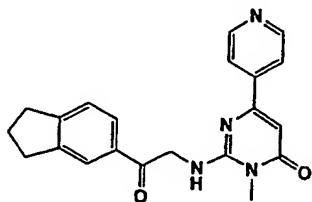
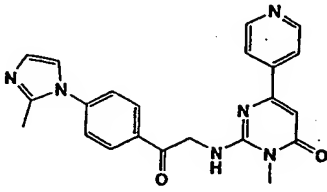
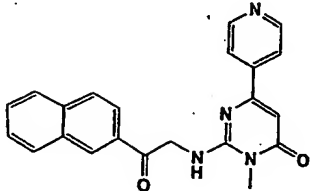
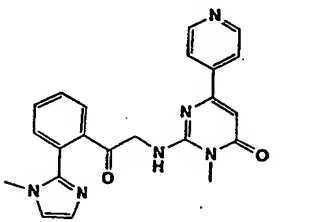
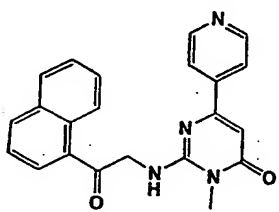
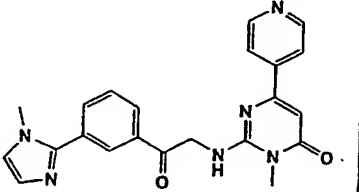
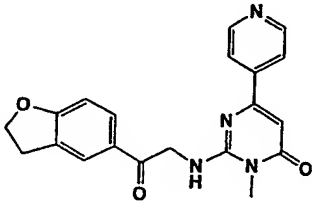
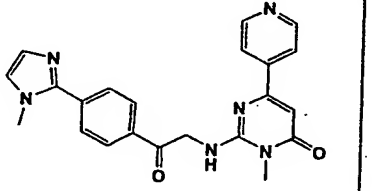
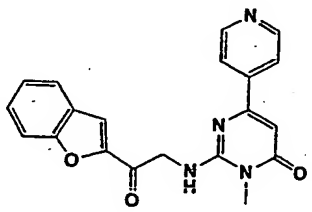
Compound No.	STRUCTURE	Compound No.	STRUCTURE
A041		A046	
A042		A047	
A043		A048	
A044		A049	
A045		A050	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
A051		A056	
A052		A057	
A053		A058	
A054		A059	
A055		A060	

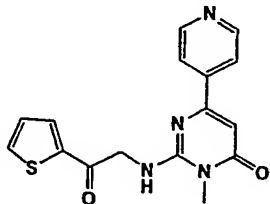
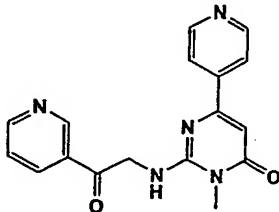
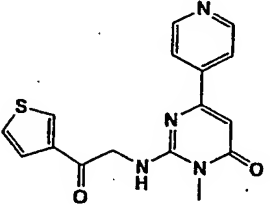
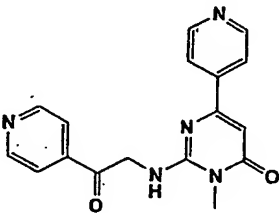
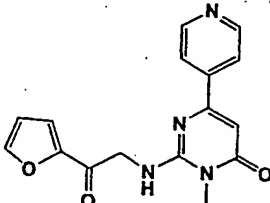
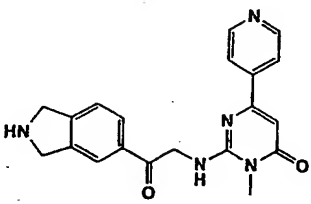
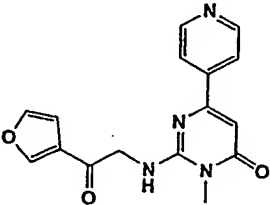
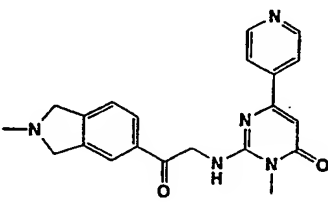
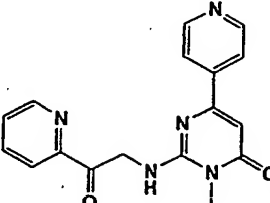
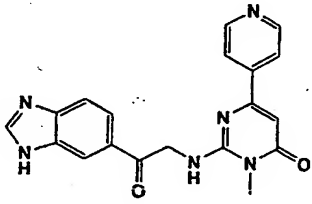
Compound No.	STRUCTURE	Compound No.	STRUCTURE
A061		A066	
A062		A067	
A063		A068	
A064		A069	
A065		A070	

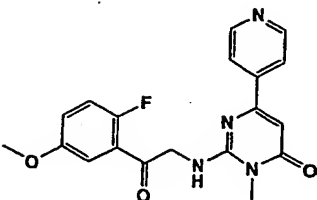
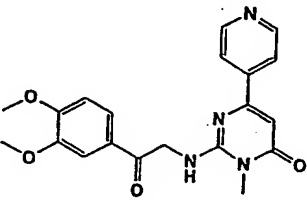
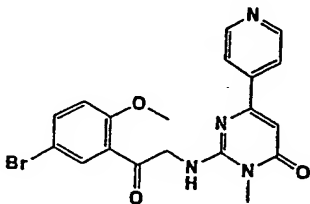
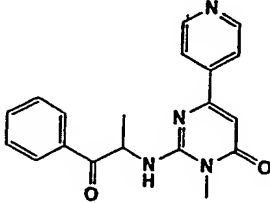
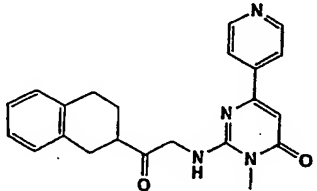
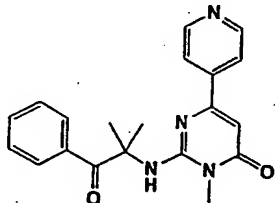
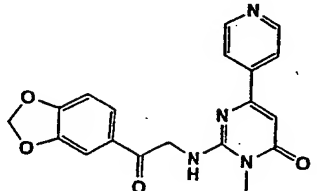
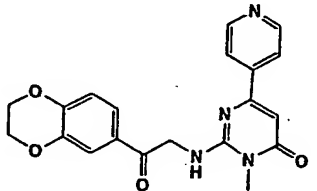
Compound No.	STRUCTURE	Compound No.	STRUCTURE
A071		A076	
A072		A077	
A073		A078	
A074		A079	
A075		A080	

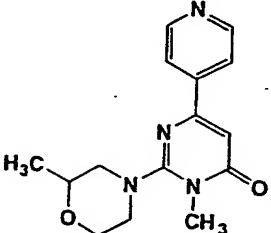
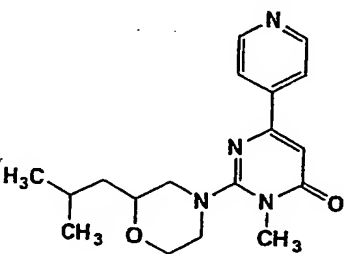
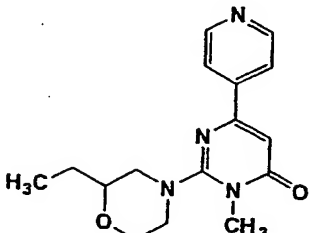
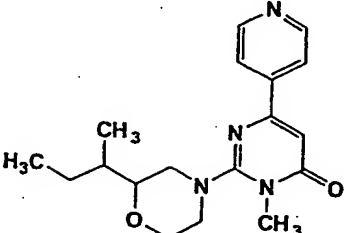
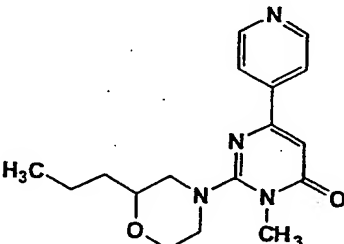
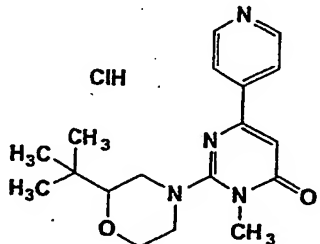
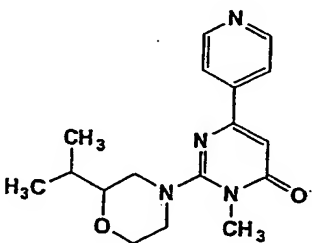
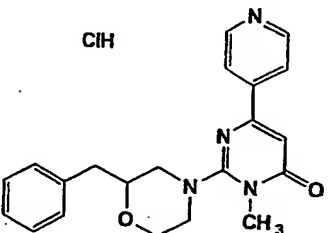
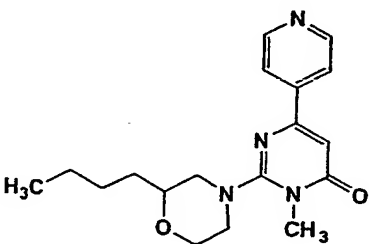
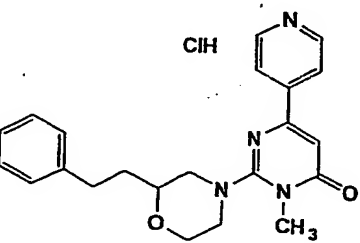
Compound No.	STRUCTURE	Compound No.	STRUCTURE
A081		A086	
A082		A087	
A083		A088	
A084		A089	
A085		A090	

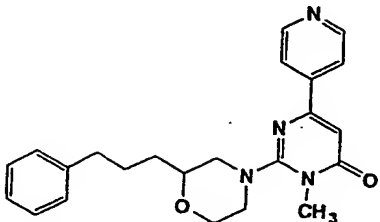
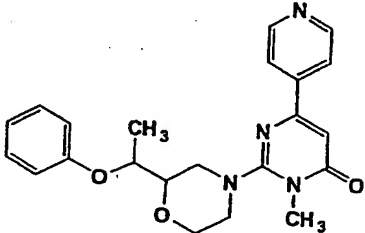
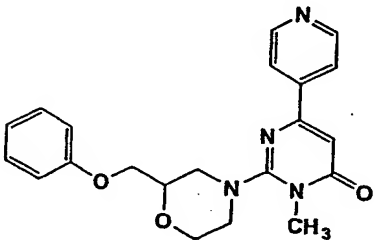
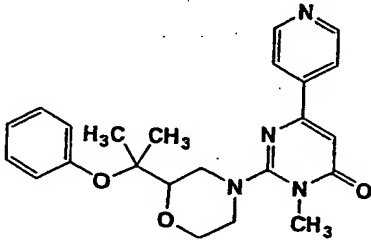
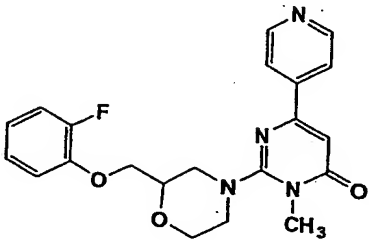
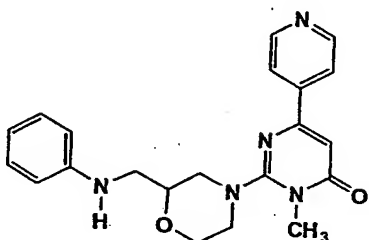
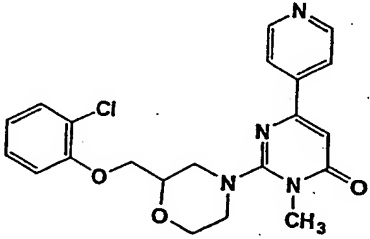
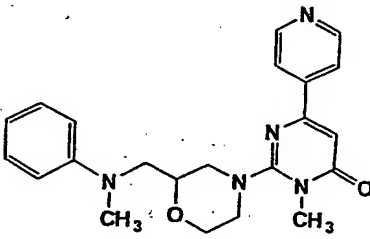
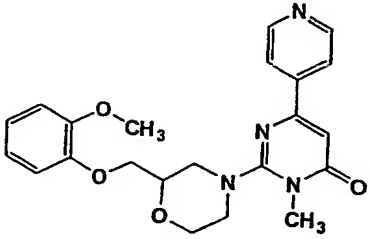
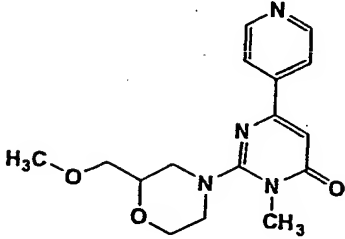
Compound No.	STRUCTURE	Compound No.	STRUCTURE
A091		A096	
A092		A097	
A093		A098	
A094		A099	
A095		A100	

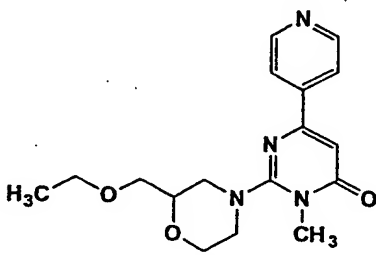
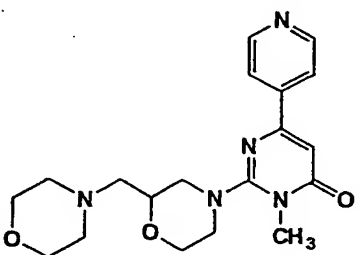
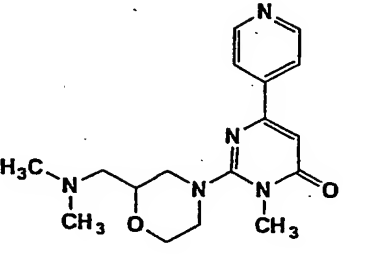
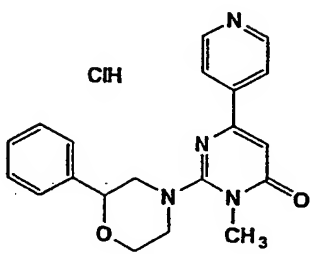
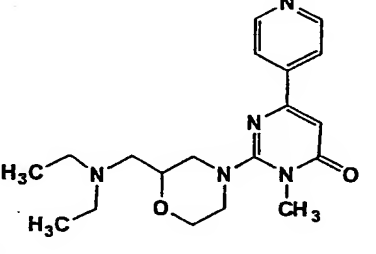
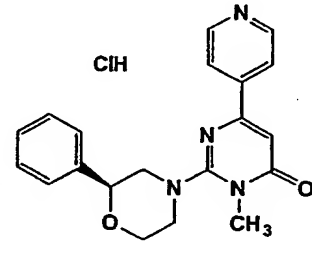
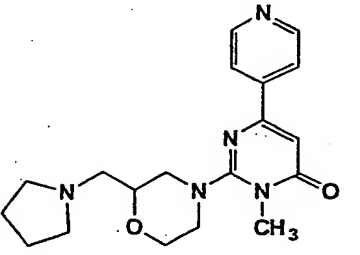
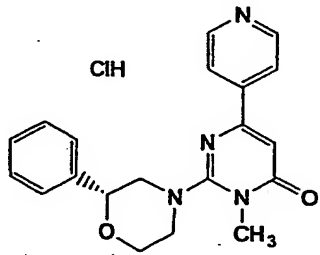
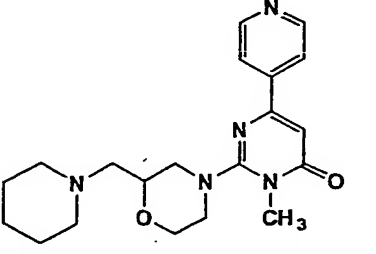
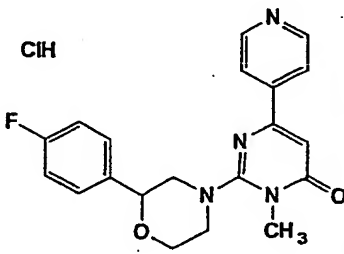


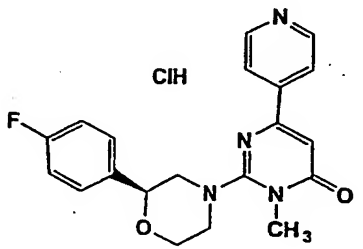
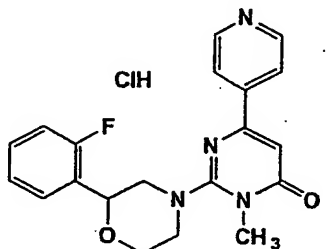
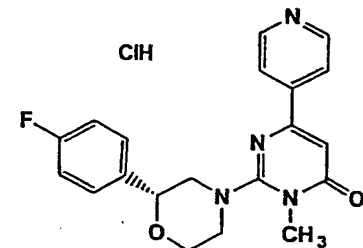
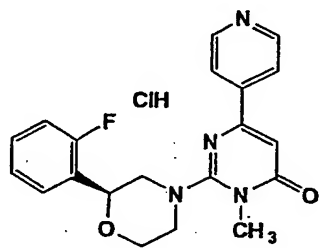
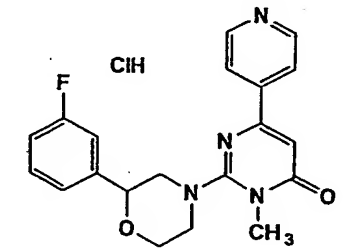
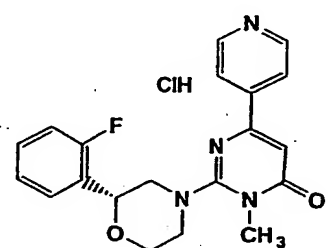
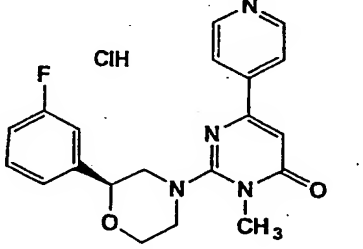
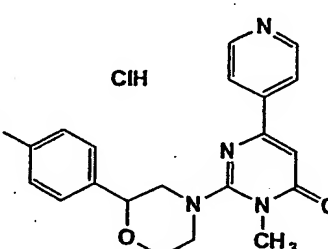
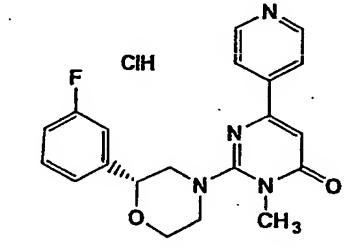
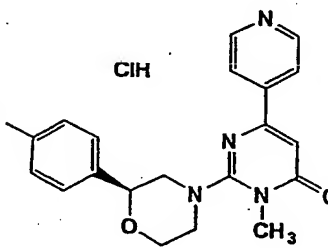
Compound No.	STRUCTURE	Compound No.	STRUCTURE
A101		A106	
A102		A107	
A103		A108	
A104		A109	
A105		A110	

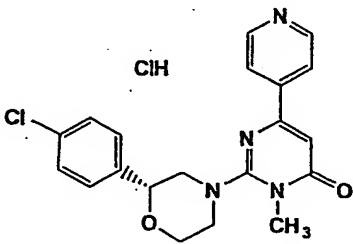
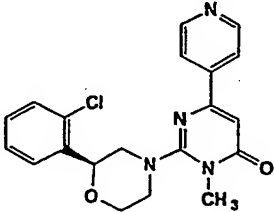
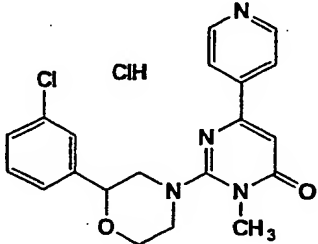
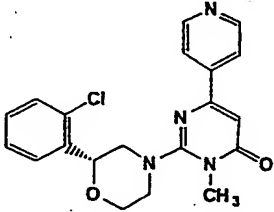
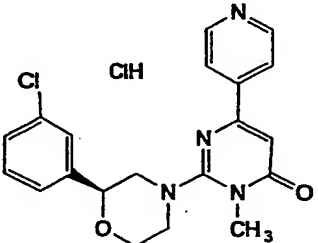
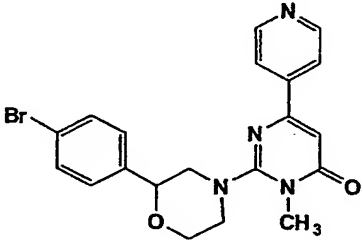
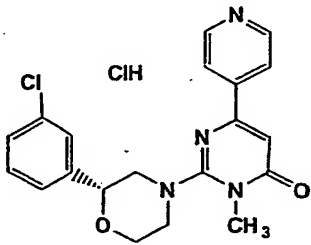
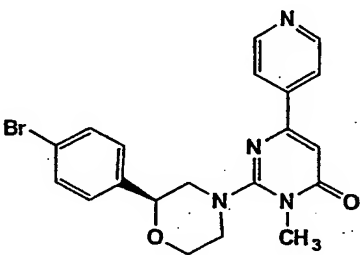
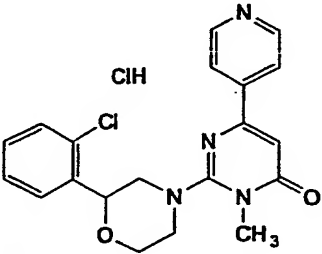
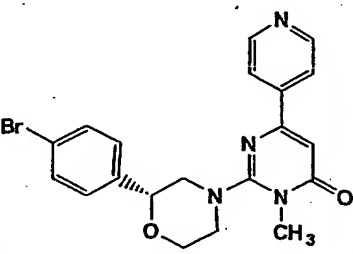
Compound No.	STRUCTURE	Compound No.	STRUCTURE
A111		A116	
A112		A117	
A113		A118	
A114			
A115			

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B001		B006	
B002		B007	
B003		B008	
B004		B009	
B005		B010	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B011		B016	
B012		B017	
B013		B018	
B014		B019	
B015		B020	

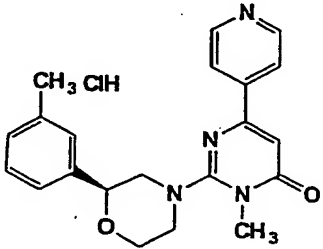
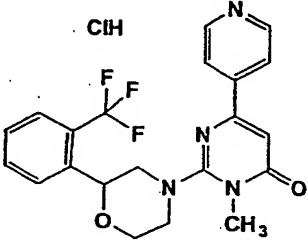
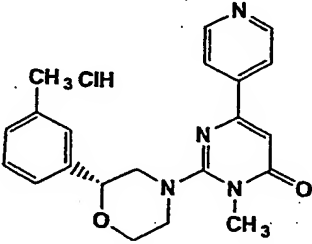
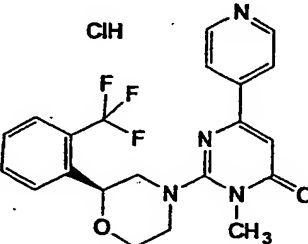
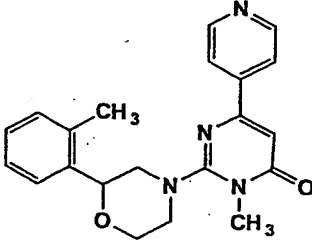
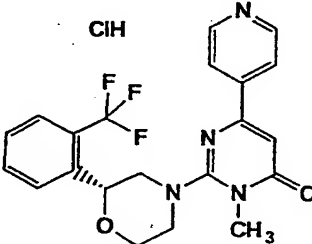
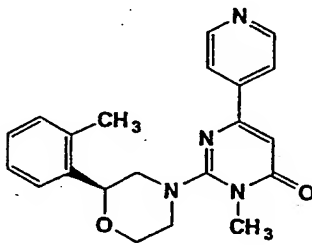
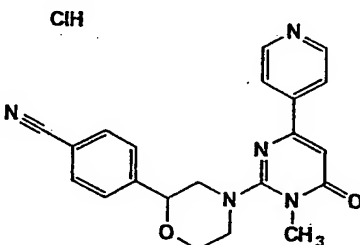
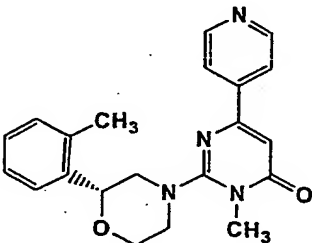
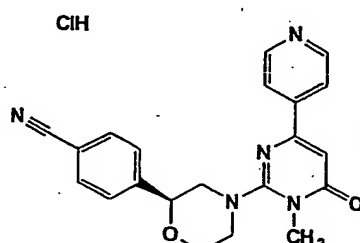
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B021		B026	
B022		B027	
B023		B028	
B024		B029	
B025		B030	

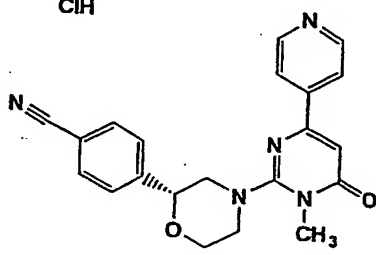
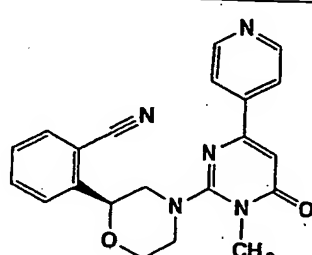
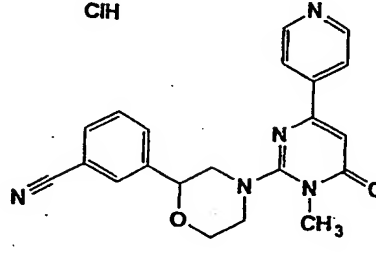
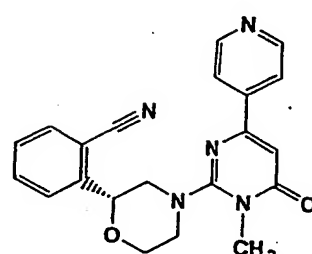
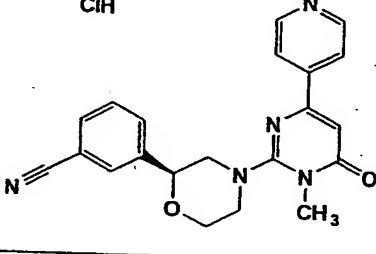
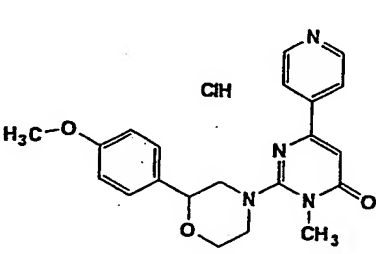
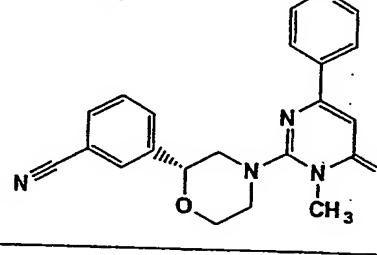
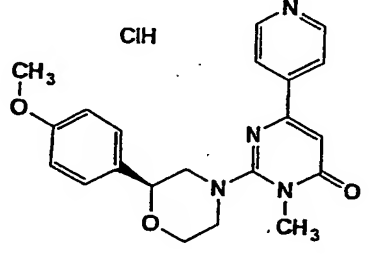
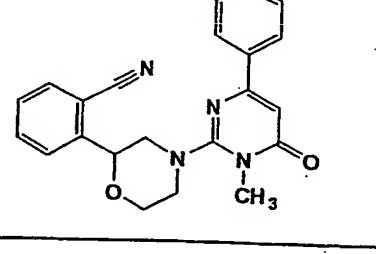
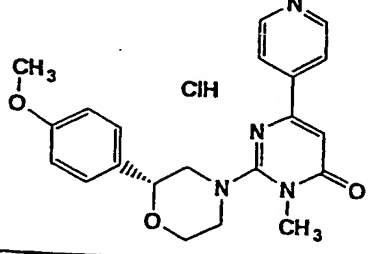
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B031	 <chem>CN1C(=O)N(C2=CC=CC=C2F)C3=CN(C4=CC=CC=N4)C5=CC=CC=C5C13OCCN3C2</chem>	B036	 <chem>CN1C(=O)N(C2=CC=CC=C2F)C3=CN(C4=CC=CC=N4)C5=CC=CC=C5C13OCCN3C2</chem>
B032	 <chem>CN1C(=O)N(C2=CC=CC=C2F)C3=CN(C4=CC=CC=N4)C5=CC=CC=C5C13OCCN3C2</chem>	B037	 <chem>CN1C(=O)N(C2=CC=CC=C2F)C3=CN(C4=CC=CC=N4)C5=CC=CC=C5C13OCCN3C2</chem>
B033	 <chem>CN1C(=O)N(C2=CC=CC=C2F)C3=CN(C4=CC=CC=N4)C5=CC=CC=C5C13OCCN3C2</chem>	B038	 <chem>CN1C(=O)N(C2=CC=CC=C2F)C3=CN(C4=CC=CC=N4)C5=CC=CC=C5C13OCCN3C2</chem>
B034	 <chem>CN1C(=O)N(C2=CC=CC=C2F)C3=CN(C4=CC=CC=N4)C5=CC=CC=C5C13OCCN3C2</chem>	B039	 <chem>CN1C(=O)N(C2=CC=CC=C2Cl)C3=CN(C4=CC=CC=N4)C5=CC=CC=C5C13OCCN3C2</chem>
B035	 <chem>CN1C(=O)N(C2=CC=CC=C2F)C3=CN(C4=CC=CC=N4)C5=CC=CC=C5C13OCCN3C2</chem>	B040	 <chem>CN1C(=O)N(C2=CC=CC=C2Cl)C3=CN(C4=CC=CC=N4)C5=CC=CC=C5C13OCCN3C2</chem>

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B041	 ClH	B046	 ClH
B042	 ClH	B047	 ClH
B043	 ClH	B048	
B044	 ClH	B049	
B045	 ClH	B050	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B051	 <chem>CN1C(=O)N(C2=CC=CC=C2C3=CC=CC=C3Br)CCO1</chem>	B056	 <chem>CN1C(=O)N(C2=CC=CC=C2C3=CC=CC=C3Br)CCO1</chem>
B052	 <chem>CN1C(=O)N(C2=CC=CC=C2C3=CC=CC=C3Br)CCO1</chem>	B057	 <chem>CN1C(=O)N(C2=CC=CC=C2C3=CC=CC=C3C)CCO1</chem>
B053	 <chem>CN1C(=O)N(C2=CC=CC=C2C3=CC=CC=C3Br)CCO1</chem>	B058	 <chem>CN1C(=O)N(C2=CC=CC=C2C3=CC=CC=C3C)CCO1</chem>
B054	 <chem>CN1C(=O)N(C2=CC=CC=C2C3=CC=CC=C3Br)CCO1</chem>	B059	 <chem>CN1C(=O)N(C2=CC=CC=C2C3=CC=CC=C3C)CCO1</chem>
B055	 <chem>CN1C(=O)N(C2=CC=CC=C2C3=CC=CC=C3Br)CCO1</chem>	B060	 <chem>CN1C(=O)N(C2=CC=CC=C2C3=CC=CC=C3C)CCO1</chem>

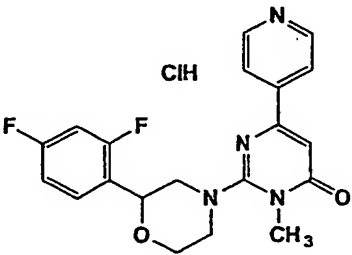
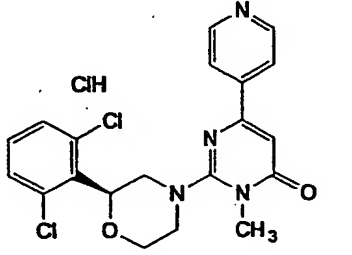
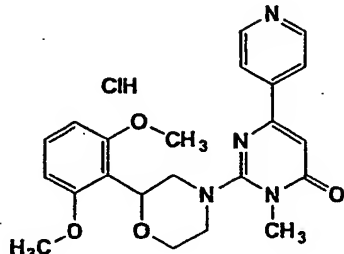
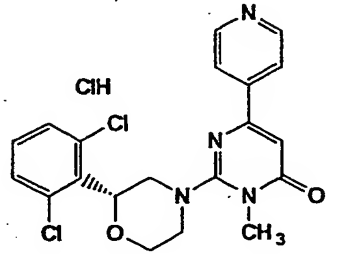
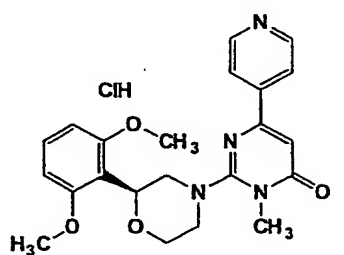
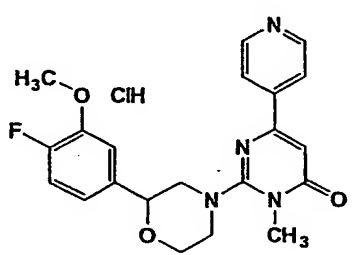
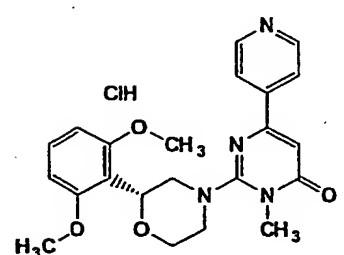
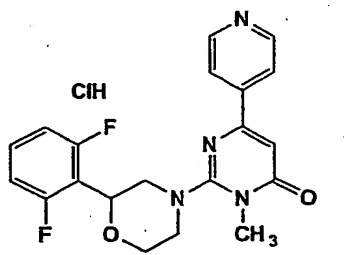
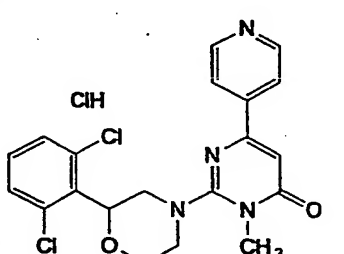
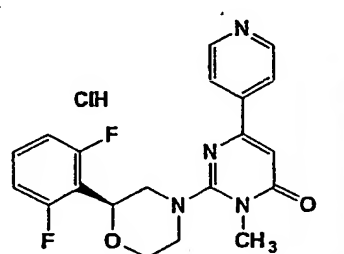


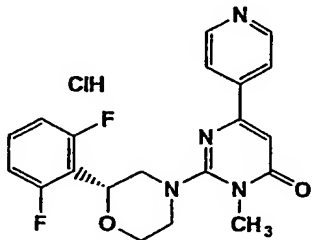
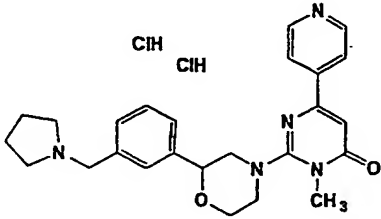
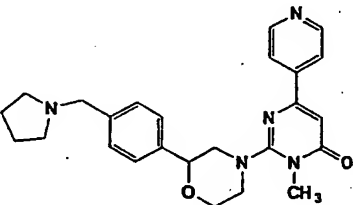
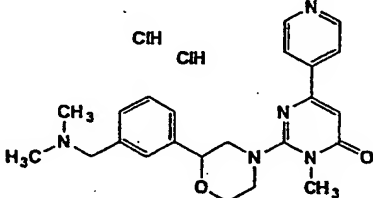
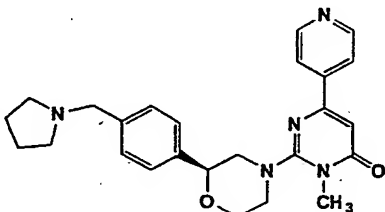
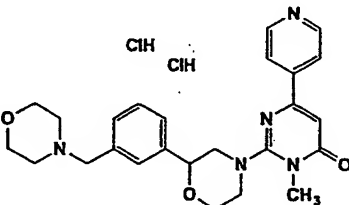
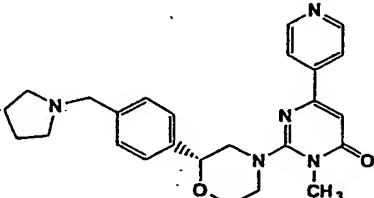
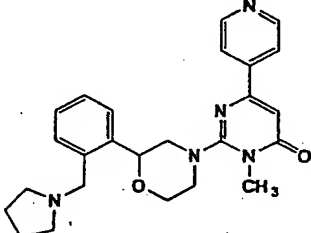
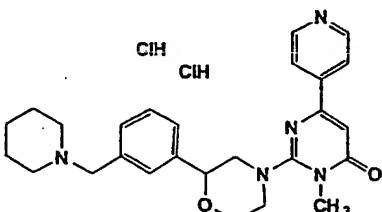
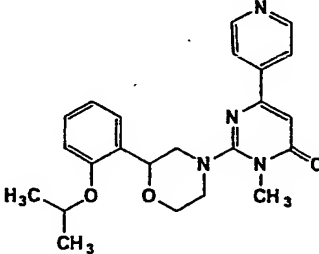
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B061		B066	
B062		B067	
B063		B068	
B064		B069	
B065		B070	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B071	<p>ClH</p> 	B076	
B072	<p>ClH</p> 	B077	
B073	<p>ClH</p> 	B078	<p>ClH</p> 
B074	<p>ClH</p> 	B079	<p>ClH</p> 
B075		B080	<p>ClH</p> 

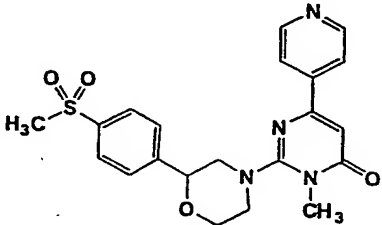
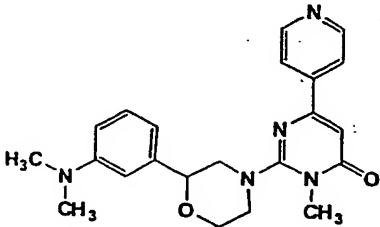
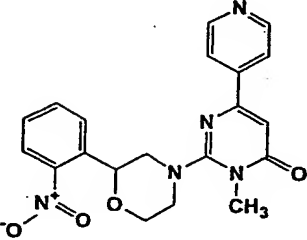
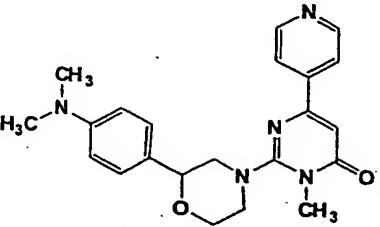
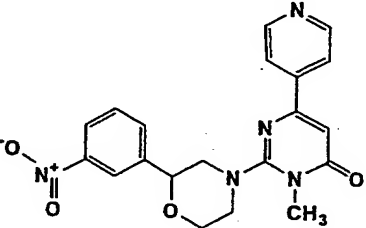
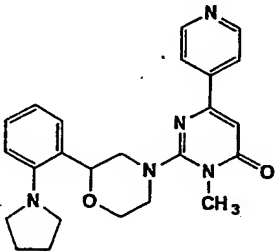
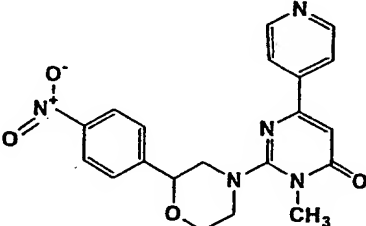
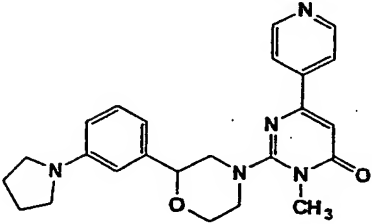
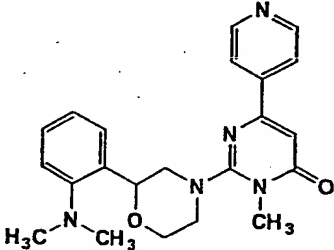
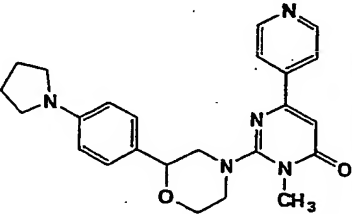
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B081	 <chem>CN1C(=O)N(C2=CC=CC=C2CO)C(=N1)CC3=CC=C(OC)C=C3</chem> ClH	B086	 <chem>CN1C(=O)N(C2=CC=CC=C2CO)C(=N1)CC3=CC=C(OC)C=C3</chem> ClH
B082	 <chem>CN1C(=O)N(C2=CC=CC=C2CO)C(=N1)CC3=CC=C(OC)C=C3</chem> ClH	B087	 <chem>CN1C(=O)N(C2=CC=CC=C2CO)C(=N1)CC3=CC=C(OC)C=C3</chem> ClH
B083	 <chem>CN1C(=O)N(C2=CC=CC=C2CO)C(=N1)CC3=CC=C(OC)C=C3</chem> ClH	B088	 <chem>CN1C(=O)N(C2=CC=CC=C2CO)C(=N1)CC3=CC=C(OC)C=C3</chem> ClH
B084	 <chem>CN1C(=O)N(C2=CC=CC=C2CO)C(=N1)CC3=CC=C(OC)C=C3</chem> ClH	B089	 <chem>CN1C(=O)N(C2=CC=CC=C2CO)C(=N1)CC3=CC=C(OC)C=C3</chem> ClH
B085	 <chem>CN1C(=O)N(C2=CC=CC=C2CO)C(=N1)CC3=CC=C(OC)C=C3</chem> ClH	B090	 <chem>CN1C(=O)N(C2=CC=CC=C2CO)C(=N1)CC3=CC=C(OC)C=C3</chem> ClH

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B091	<p>ClH</p>	B096	<p>ClH</p>
B092		B097	
B093		B098	
B094	<p>ClH</p>	B099	<p>ClH</p>
B095	<p>ClH</p>	B100	<p>ClH</p>

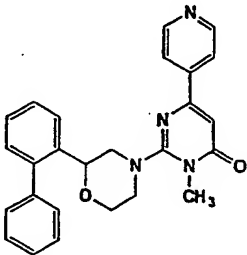
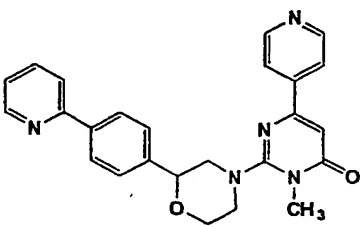
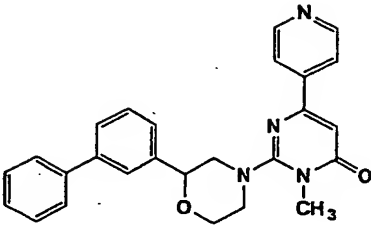
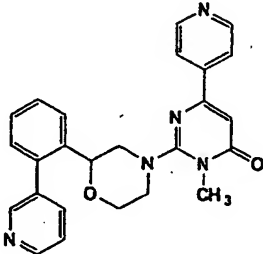
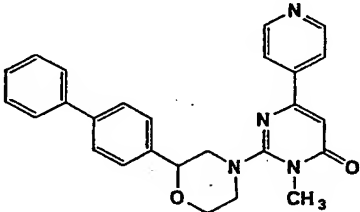
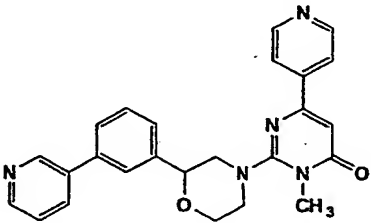
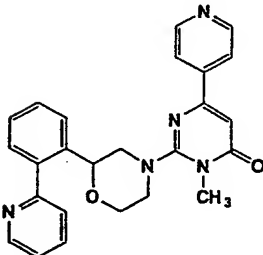
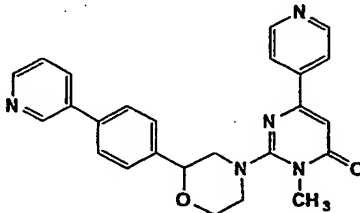
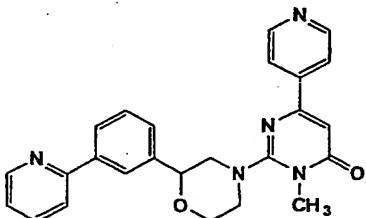
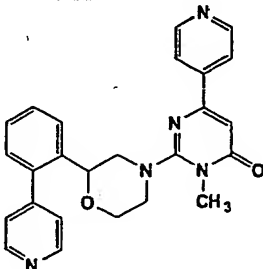
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B101		B106	
B102		B107	
B103		B108	
B104		B109	
B105		B110	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B111		B116	
B112		B117	
B113		B118	
B114		B119	
B115		B120	

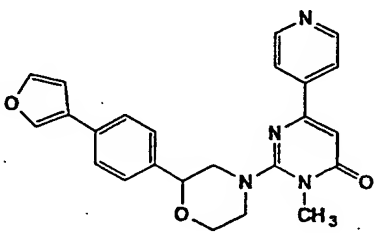
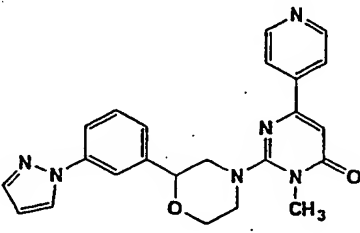
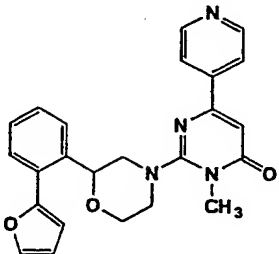
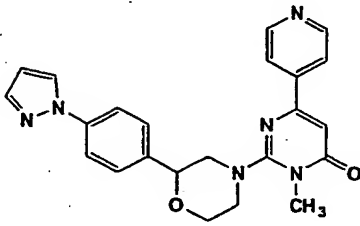
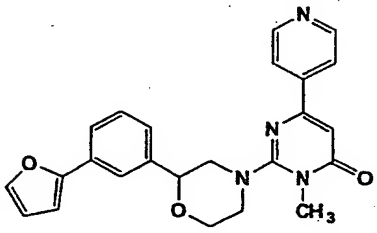
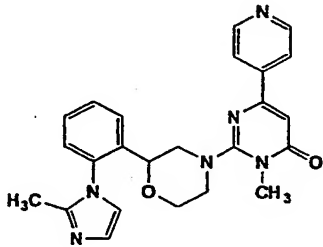
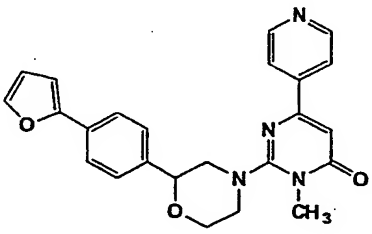
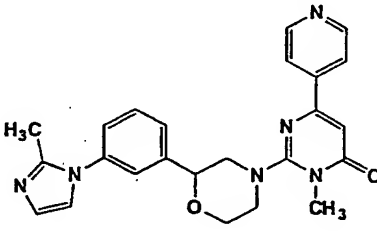
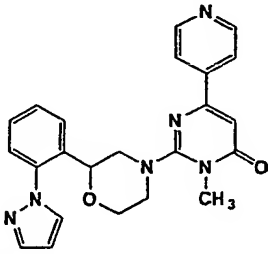
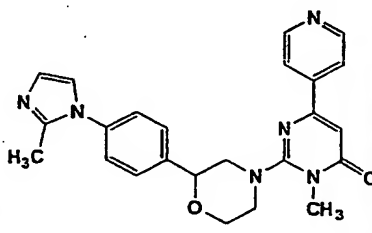
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B121		B126	
B122		B127	
B123		B128	
B124		B129	
B125		B130	

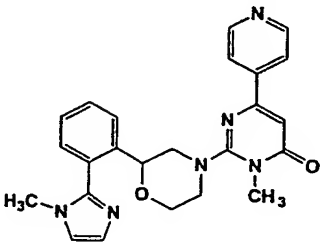
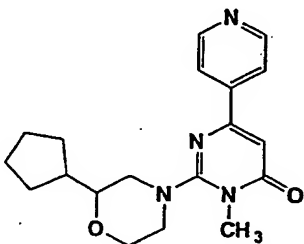
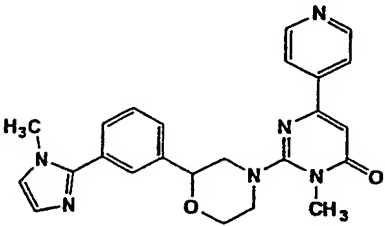
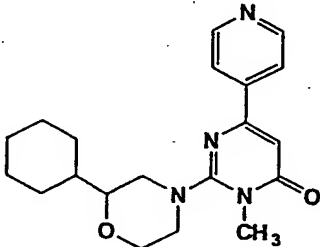
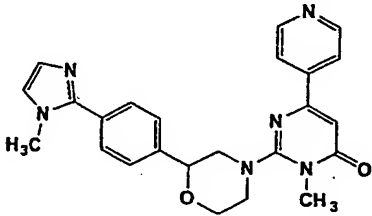
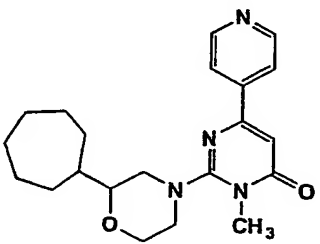
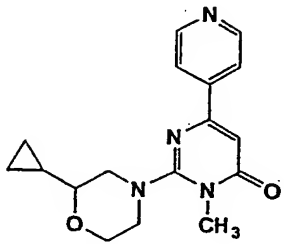
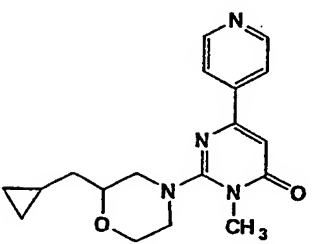
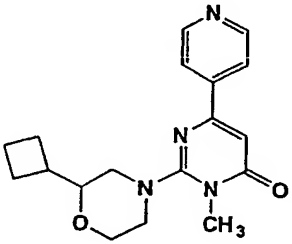
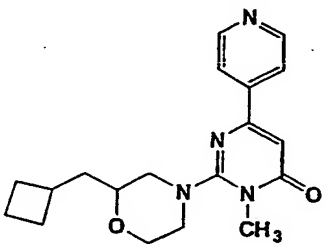
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B131		B136	
B132		B137	
B133		B138	
B134		B139	
B135		B140	

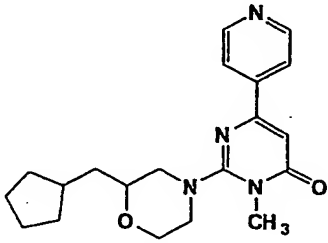
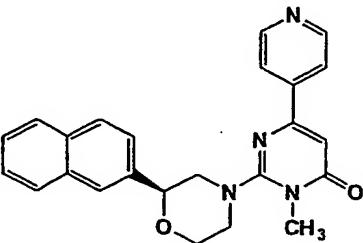
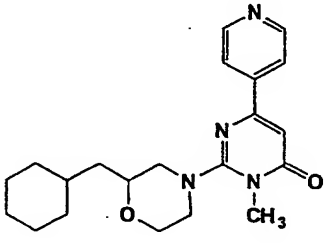
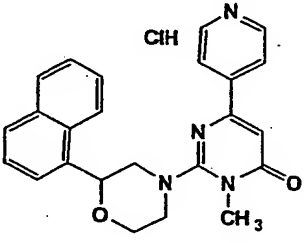
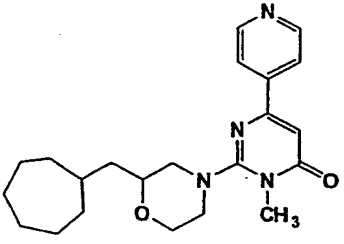
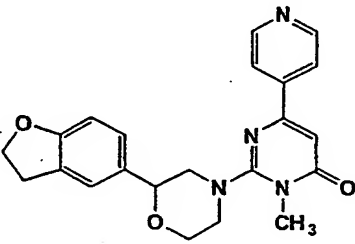
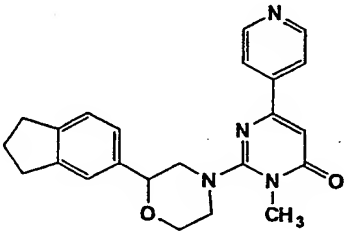
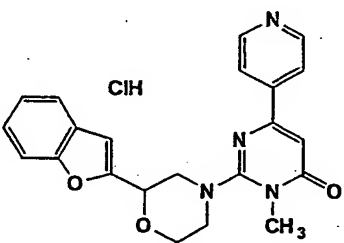
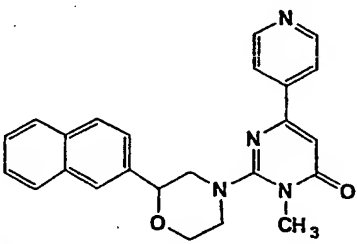
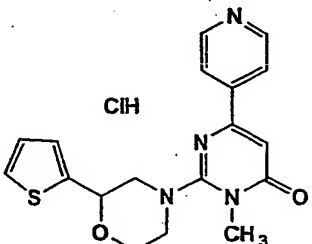


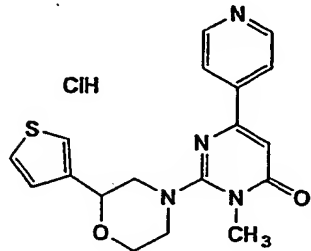
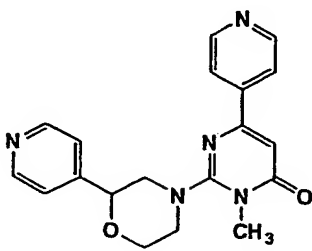
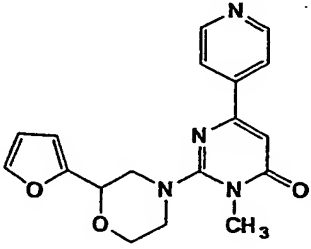
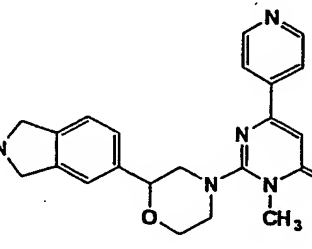
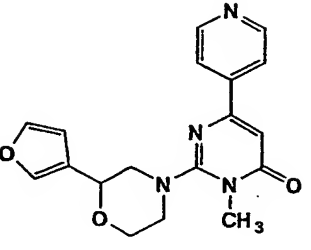
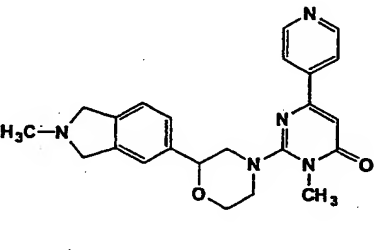
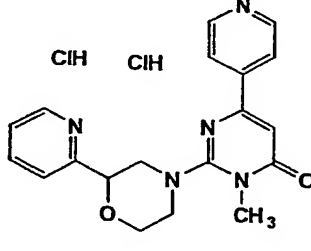
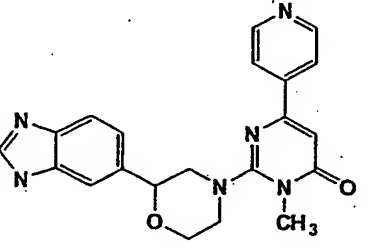
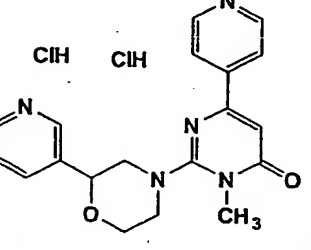
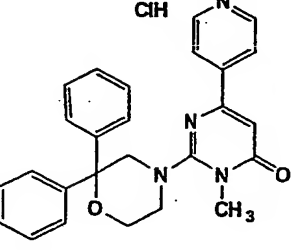
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B141		B146	
B142		B147	
B143		B148	
B144		B149	
B145		B150	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B151		B156	
B152		B157	
B153		B158	
B154		B159	
B155		B160	

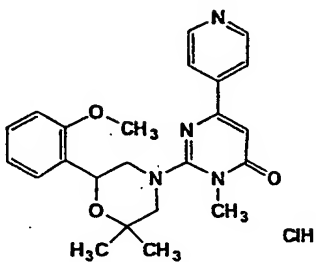
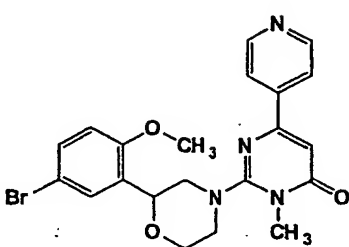
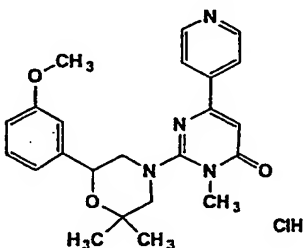
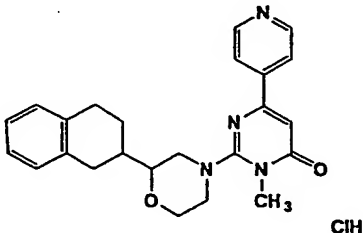
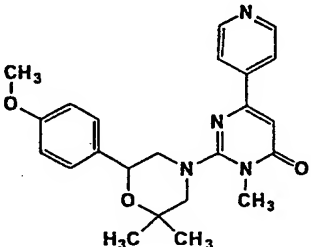
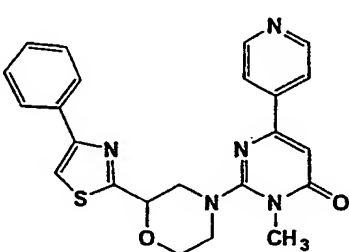
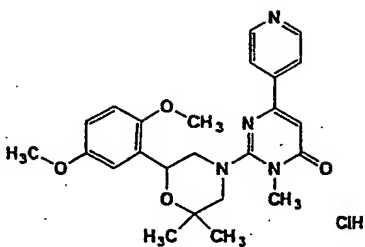
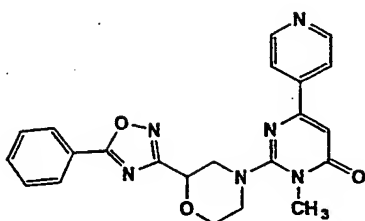
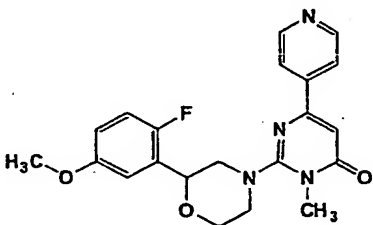
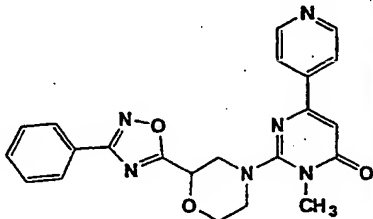
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B161		B166	
B162		B167	
B163		B168	
B164		B169	
B165		B170	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B171		B176	
B172		B177	
B173		B178	
B174		B179	
B175		B180	

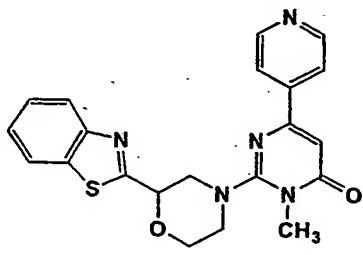
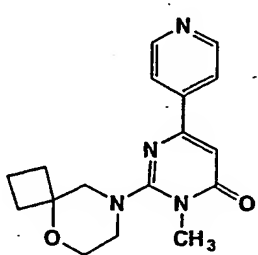
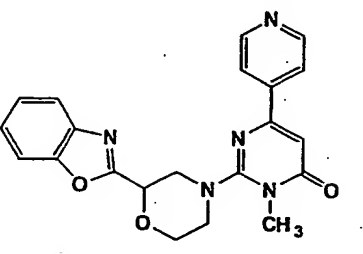
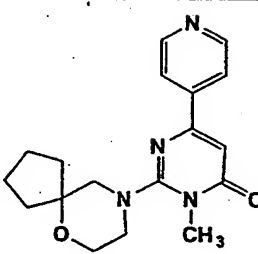
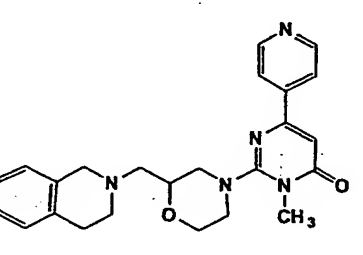
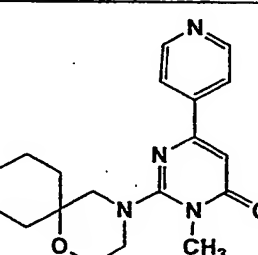
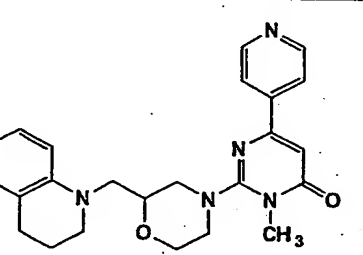
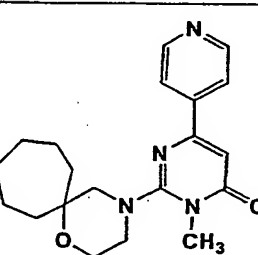
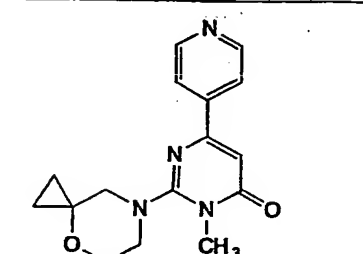
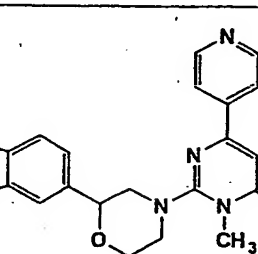
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B181		B186	
B182		B187	
B183		B188	
B184		B189	
B185		B190	

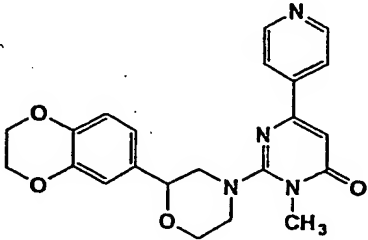
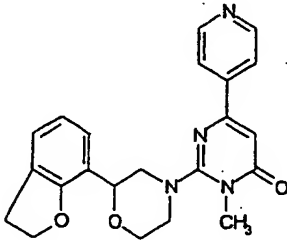
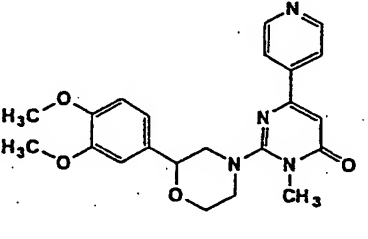
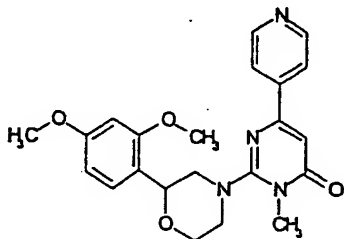
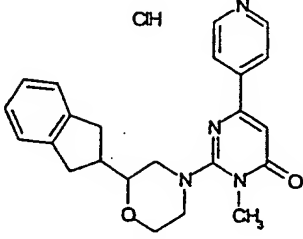
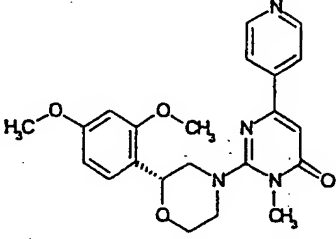
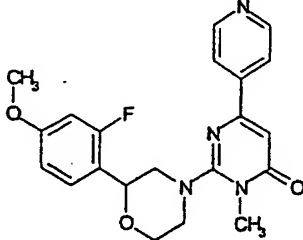
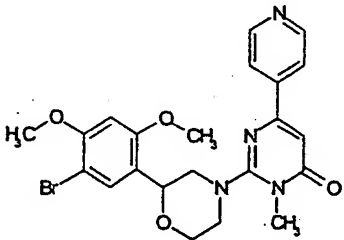
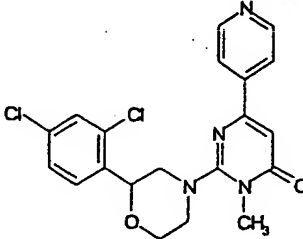
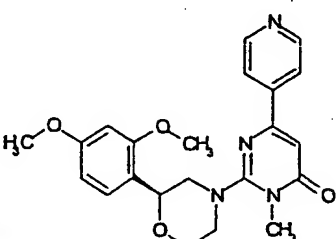
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B191	 <chem>CN1C(=O)N(C2CCOC2c3ccsc3)C(=N1)c4cccnc4</chem> ClH	B196	 <chem>CN1C(=O)N(C2CCOC2c3ccncc3)C(=N1)c4cccnc4</chem>
B192	 <chem>CN1C(=O)N(C2CCOC2c3ccoc3)C(=N1)c4cccnc4</chem>	B197	 <chem>CN1C(=O)N(C2CCOC2c3ccc4c(c3)CNC4)C(=N1)c4cccnc4</chem>
B193	 <chem>CN1C(=O)N(C2CCOC2c3ccoc3)C(=N1)c4cccnc4</chem>	B198	 <chem>CN1C(=O)N(C2CCOC2c3ccc4c(c3)CNC4C)C(=N1)c4cccnc4</chem>
B194	 <chem>CN1C(=O)N(C2CCOC2c3ccncc3)C(=N1)c4cccnc4</chem> ClH ClH	B199	 <chem>CN1C(=O)N(C2CCOC2c3ccc4c(c3)CNC4)C(=N1)c4cccnc4</chem>
B195	 <chem>CN1C(=O)N(C2CCOC2c3ccncc3)C(=N1)c4cccnc4</chem> ClH ClH	B200	 <chem>CN1C(=O)N(C2CCOC2c3ccc4c(c3)CNC4)C(=N1)c4cccnc4</chem> ClH

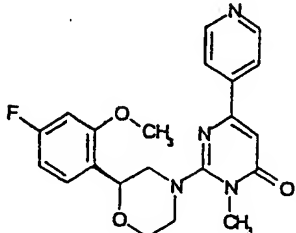
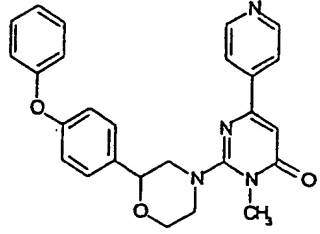
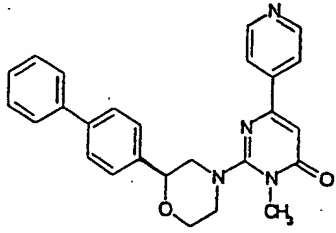
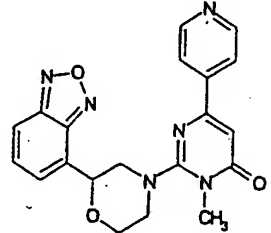
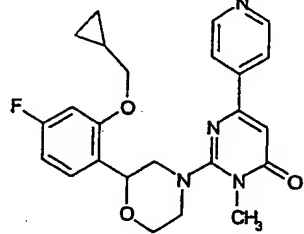
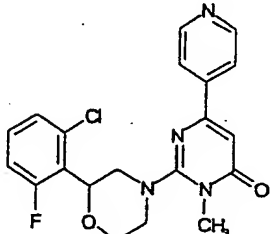
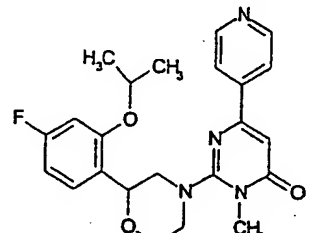
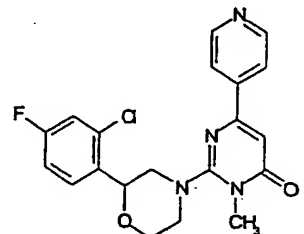
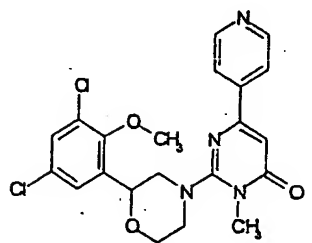
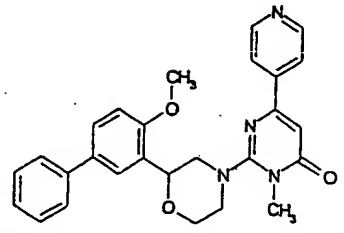
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B201		B207	
B202		B208	
B203		B209	
B205		B213	
B206		B214	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B215		B220	
B216		B221	
B217		B222	
B218		B223	
B219		B224	

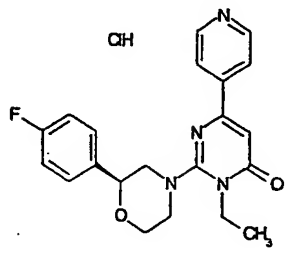
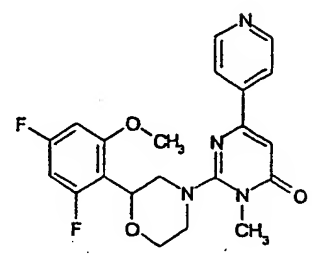
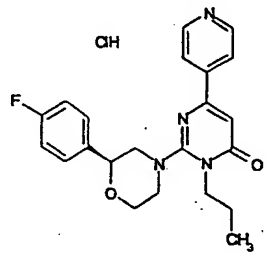
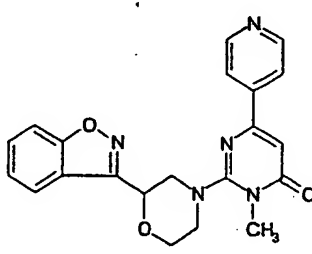
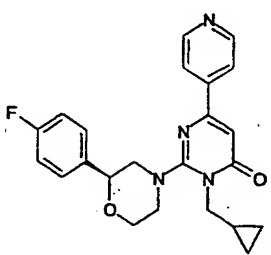
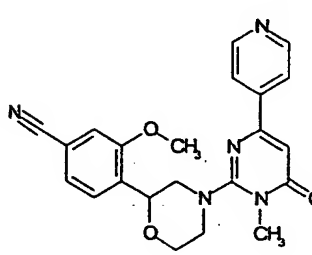
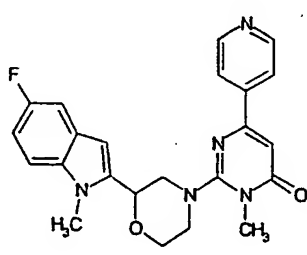
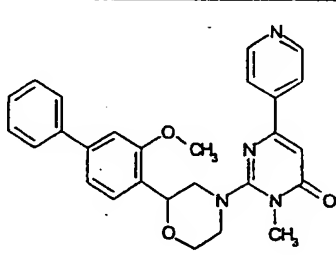
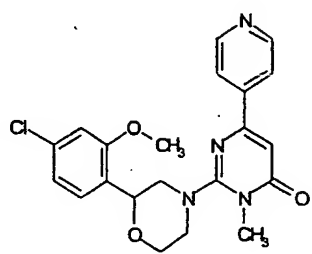
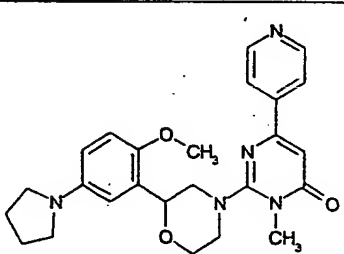


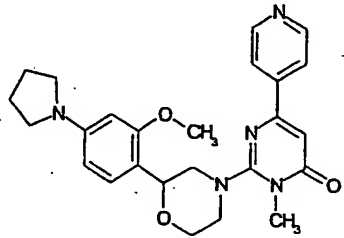
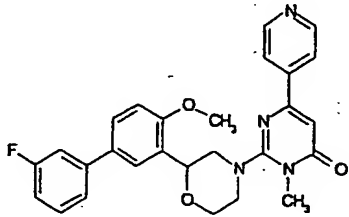
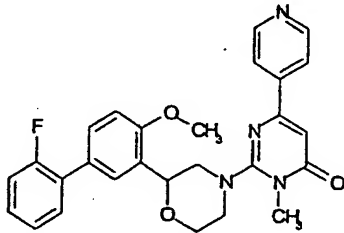
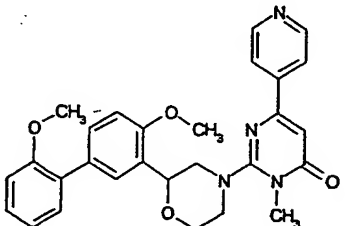
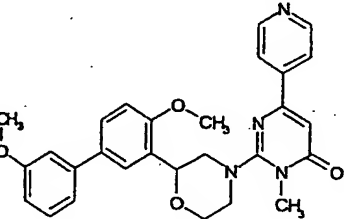
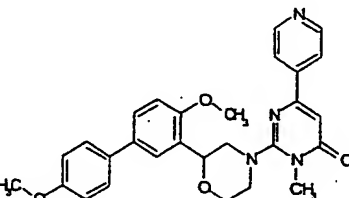
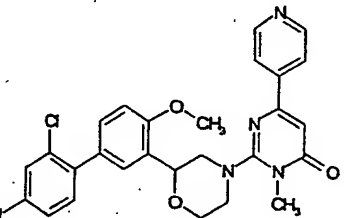
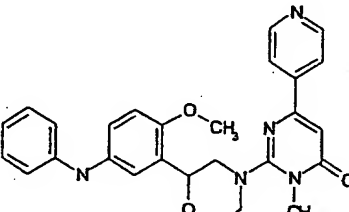
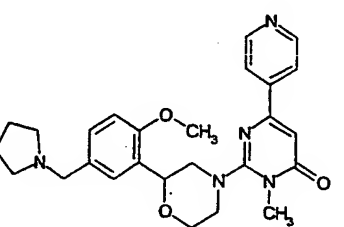
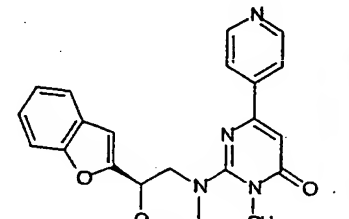
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B225		B230	
B226		B231	
B227		B232	
B228		B233	
B229		B234	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B235		B240	
B236		B241	
B237		B242	
B238		B243	
B239		B244	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B245		B250	
B246		B251	
B247		B252	
B248		B253	
B249		B254	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B255		B260	
B256		B261	
B257		B262	
B258		B263	
B259		B264	

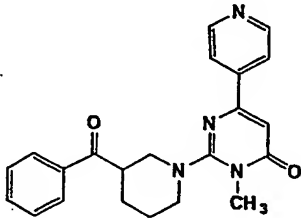
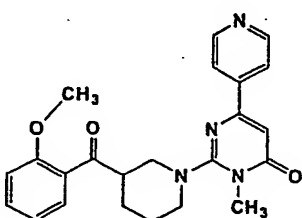
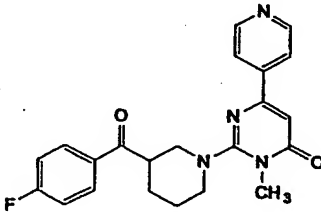
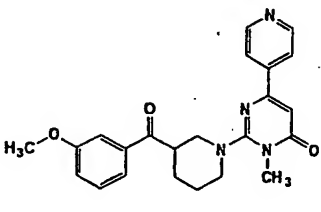
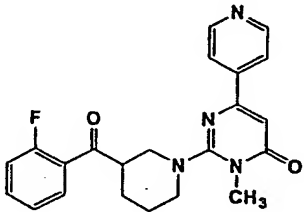
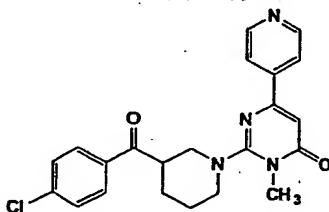
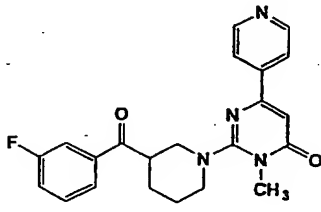
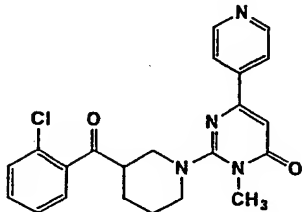
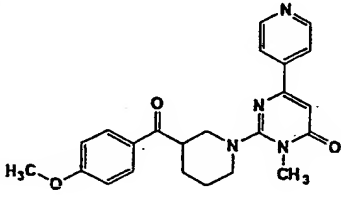
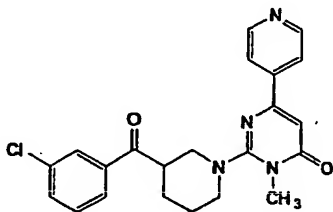
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B265		B270	
B266		B271	
B267		B272	
B268		B273	
B269		B274	

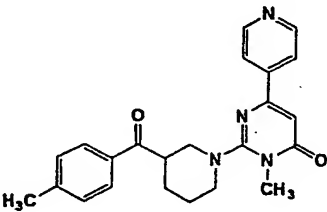
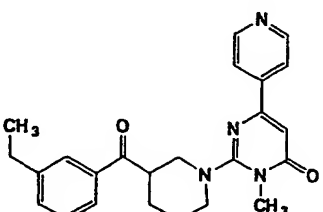
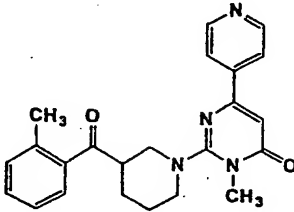
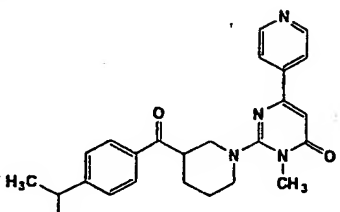
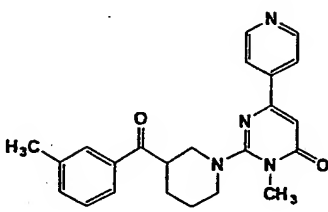
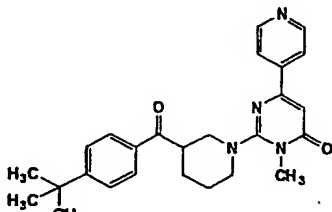
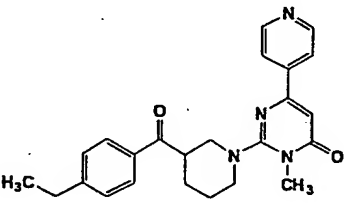
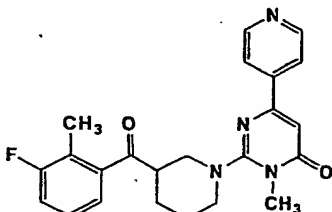
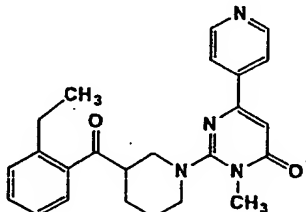
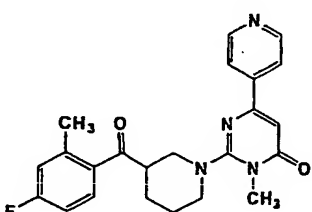
Compound No.	STRUCTURE	Compound No.	STRUCTURE
B275		B280	
B276		B281	
B277		B282	
B278		B283	
B279		B284	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B285		B290	
B286		B291	
B287		B292	
B288		B293	
B289		B294	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
B295		B297	
B296		B298	

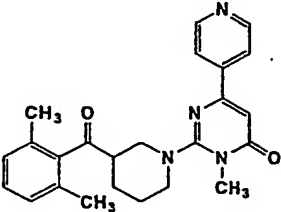
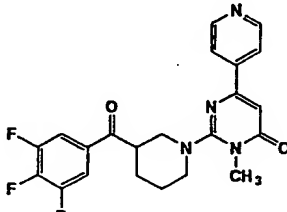
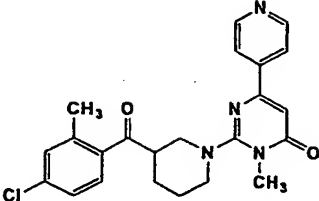
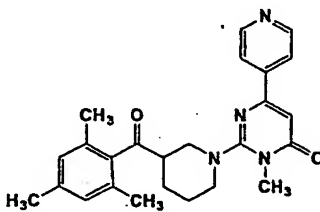
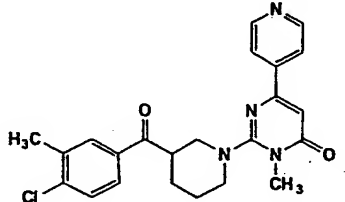
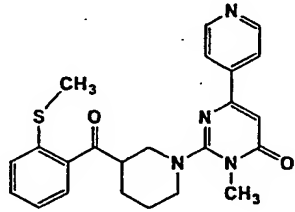
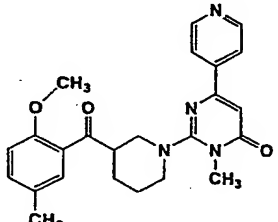
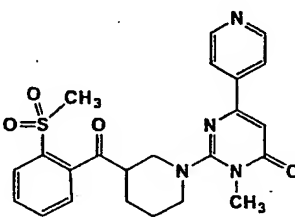
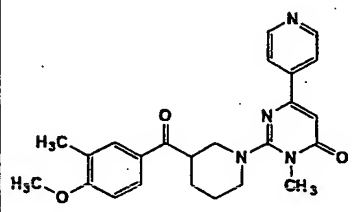
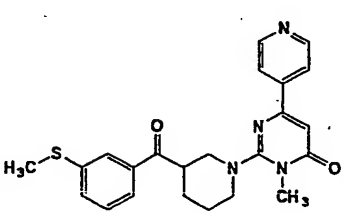


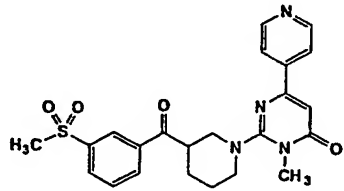
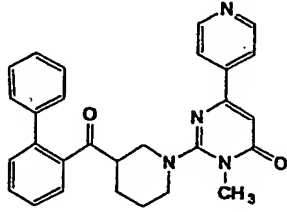
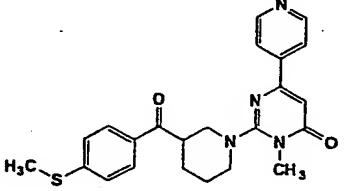
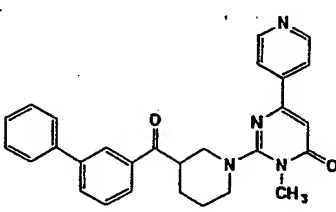
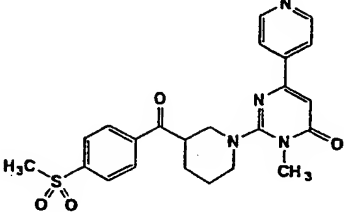
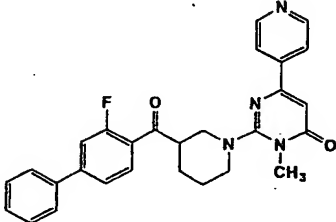
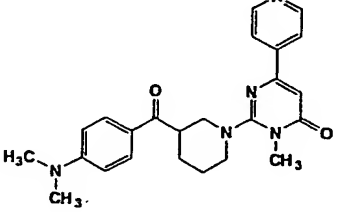
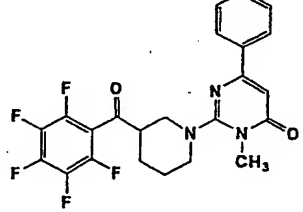
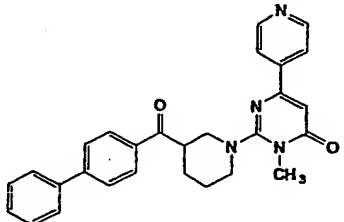
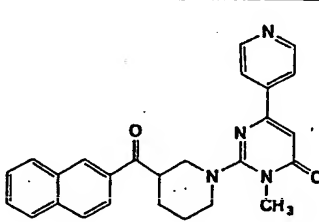
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C001		C006	
C002		C007	
C003		C008	
C004		C009	
C005		C010	

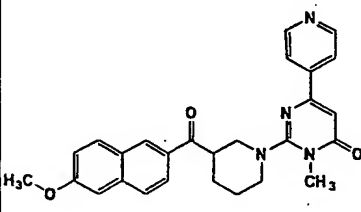
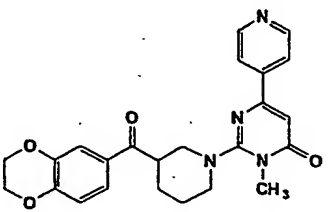
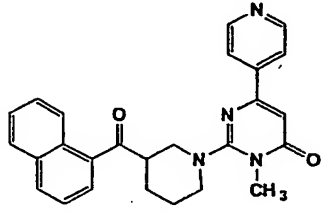
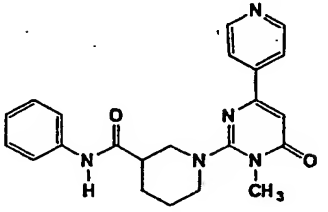
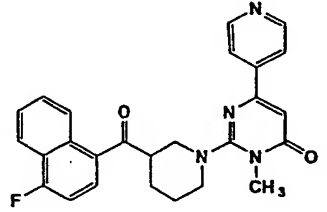
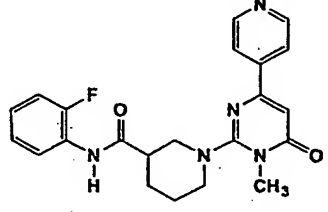
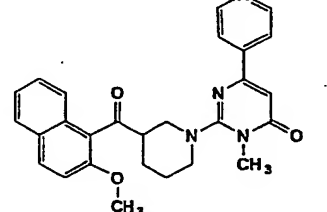
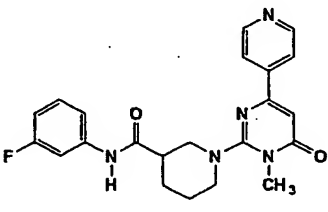
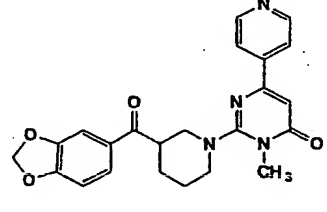
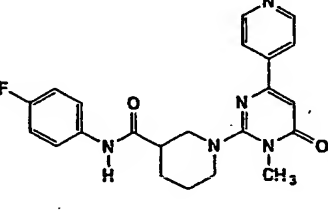
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C011		C016	
C012		C017	
C013		C018	
C014		C019	
C015		C020	

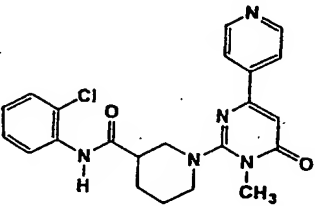
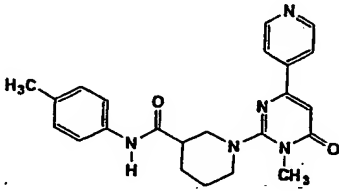
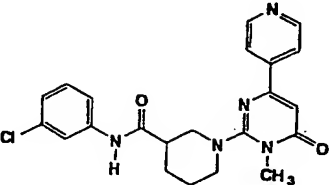
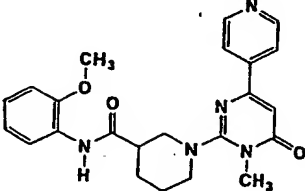
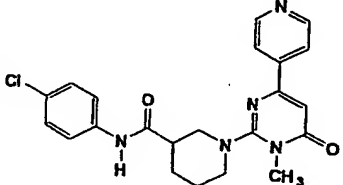
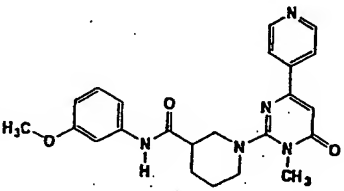
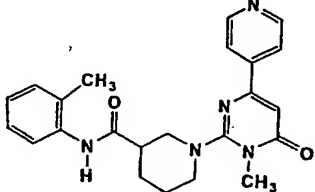
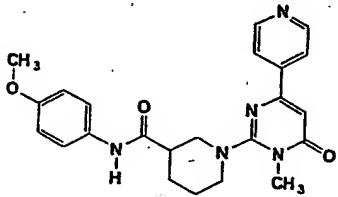
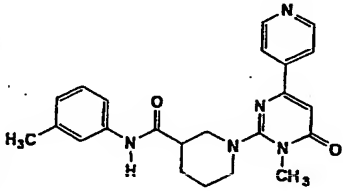
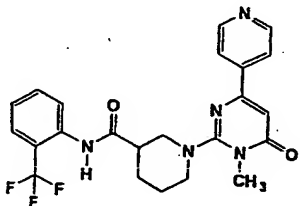
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C021		C026	
C022		C027	
C023		C028	
C024		C029	
C025		C030	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
C031		C036	
C032		C037	
C033		C038	
C034		C039	
C035		C040	

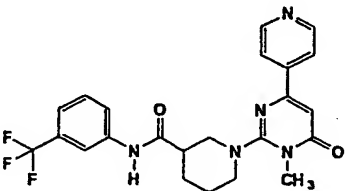
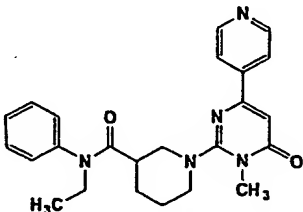
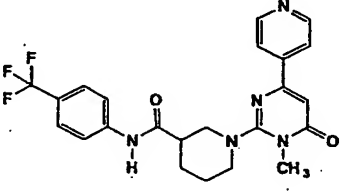
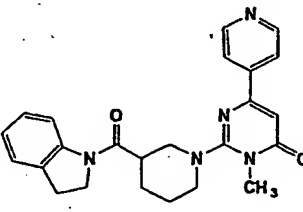
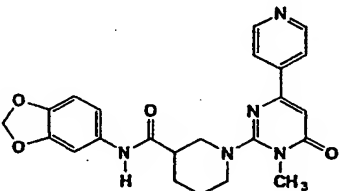
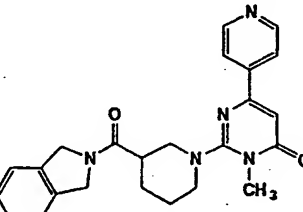
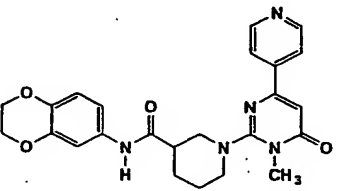
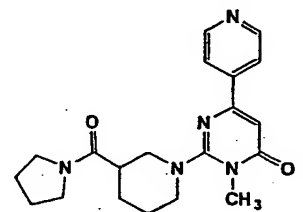
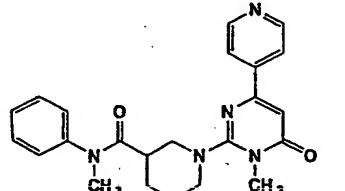
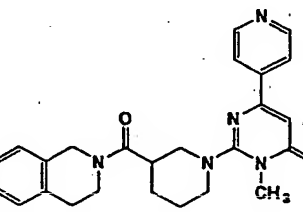
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C041		C046	
C042		C047	
C043		C048	
C044		C049	
C045		C050	

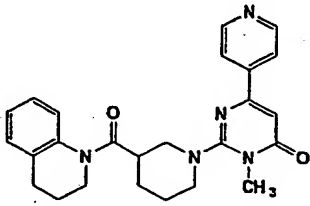
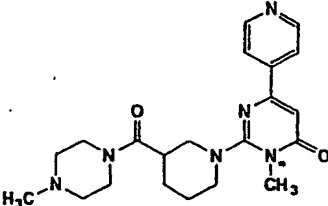
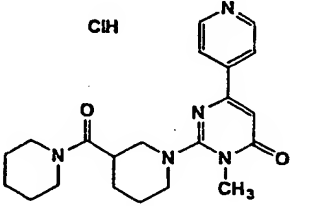
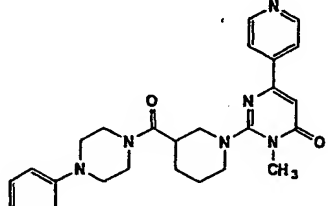
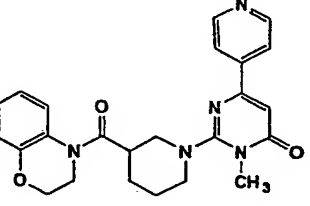
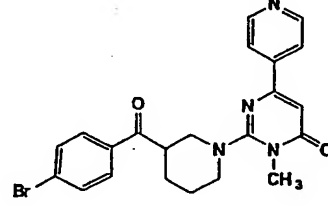
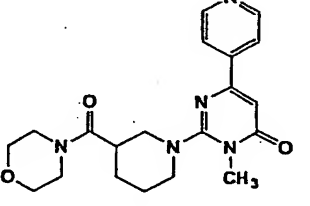
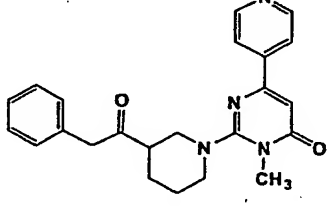
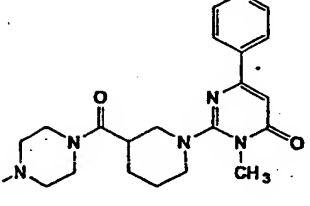
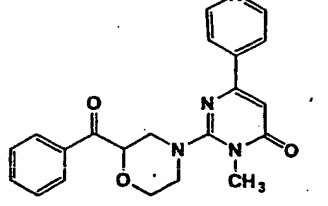
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C051		C056	
C052		C057	
C053		C058	
C054		C059	
C055		C060	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
C061		C066	
C062		C067	
C063		C068	
C064		C069	
C065		C070	

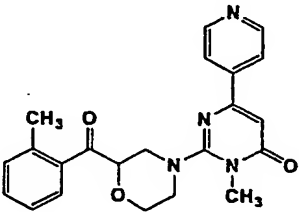
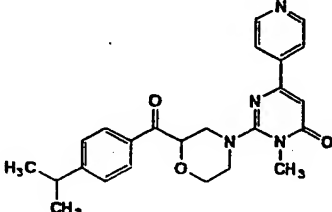
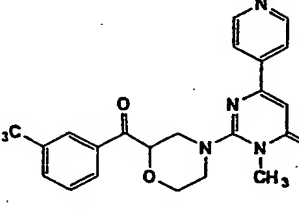
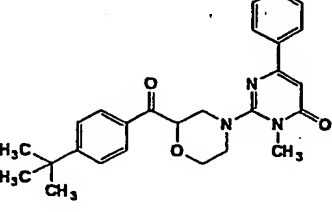
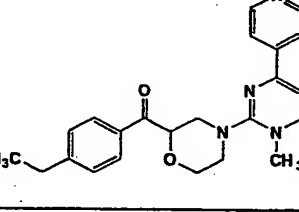
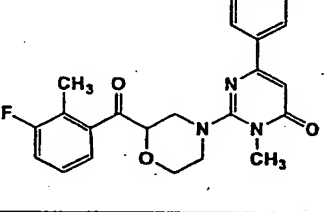
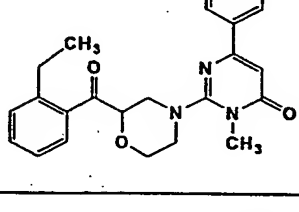
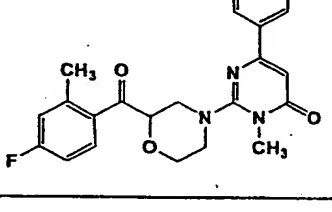
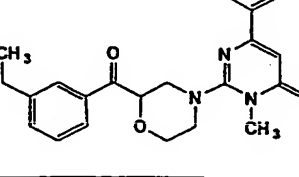
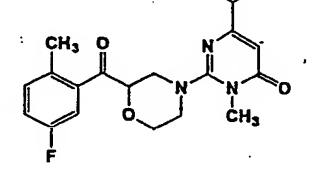
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C071		C076	
C072		C077	
C073		C078	
C074		C079	
C075		C080	



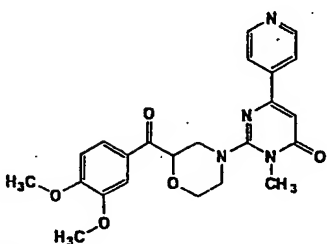
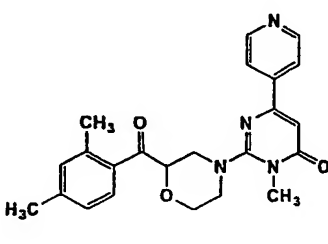
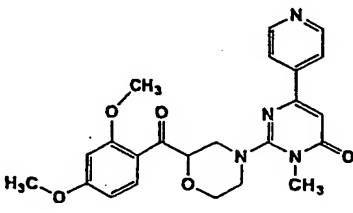
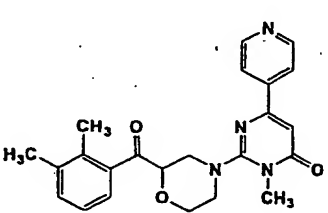
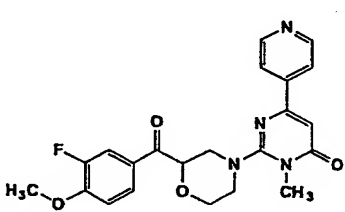
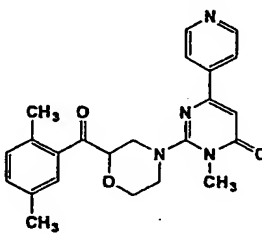
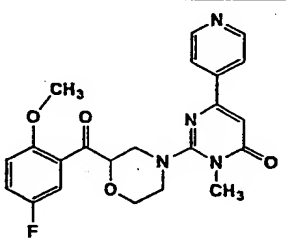
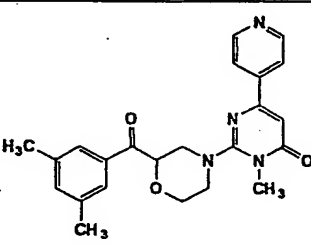
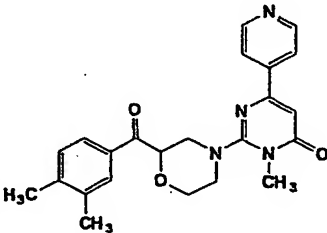
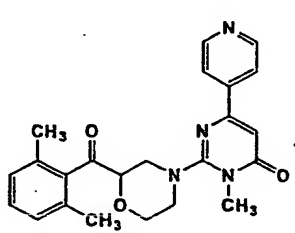
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C081		C086	
C082		C087	
C083		C088	
C084		C089	
C085		C090	

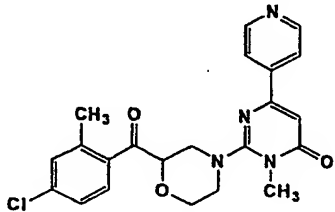
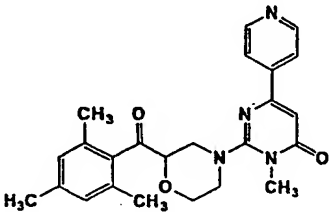
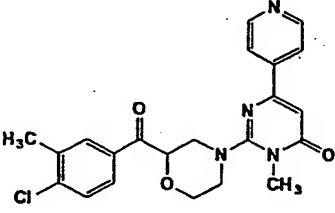
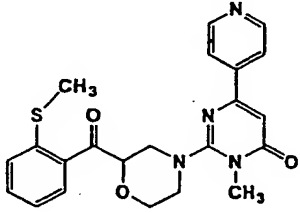
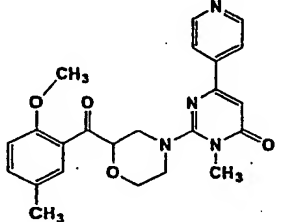
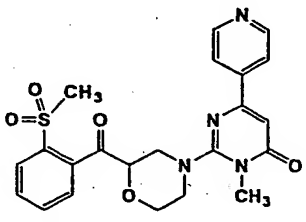
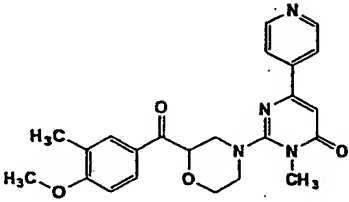
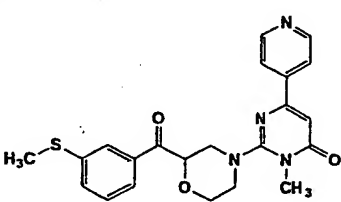
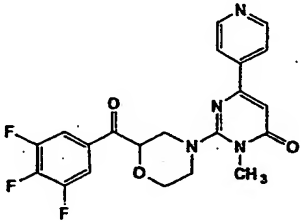
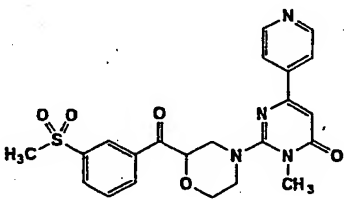
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C091		C096	
C092	 ClH	C097	
C093		C098	
C094		C099	
C095		C101	

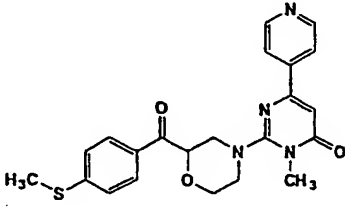
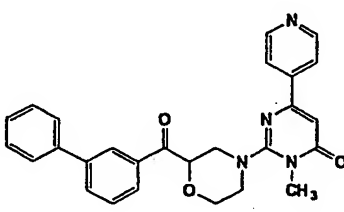
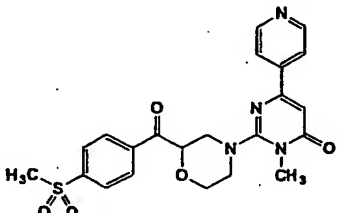
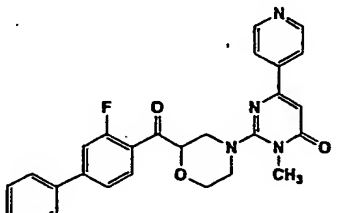
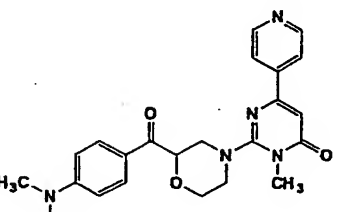
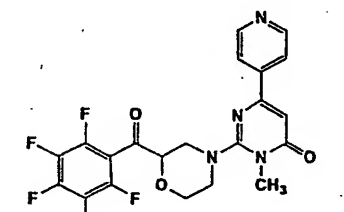
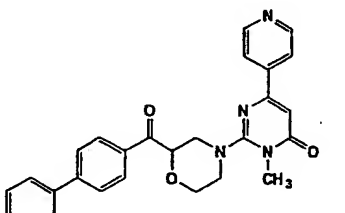
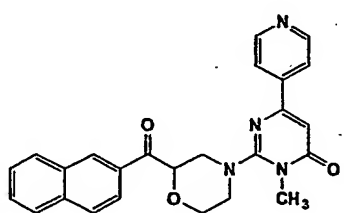
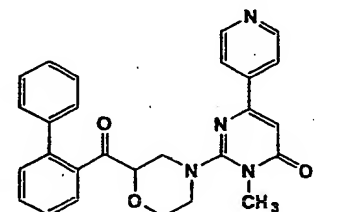
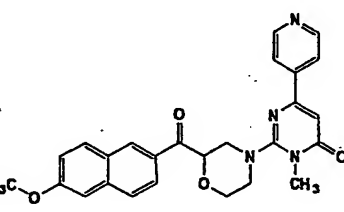
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C102		C107	
C103		C108	
C104		C109	
C105		C110	
C106		C111	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
C112		C117	
C113		C118	
C114		C119	
C115		C120	
C116		C121	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
C122		C127	
C123		C128	
C124		C129	
C125		C130	
C126		C131	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
C132		C137	
C133		C138	
C134		C139	
C135		C140	
C136		C141	

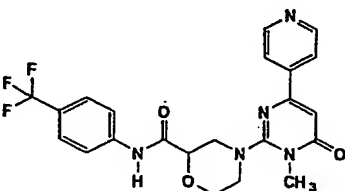
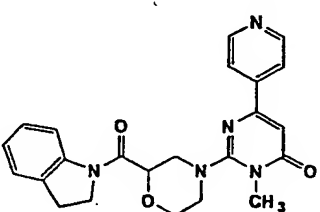
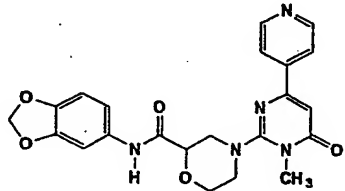
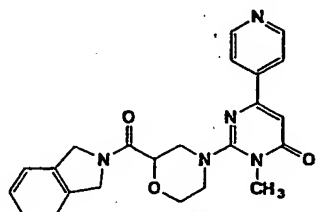
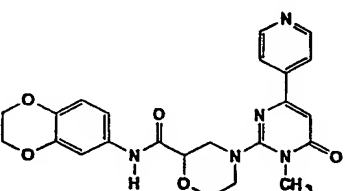
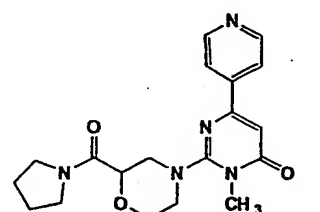
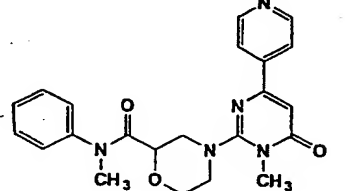
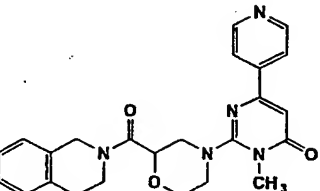
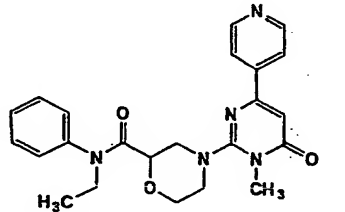
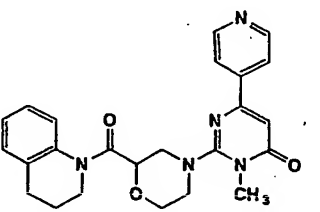
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C142		C147	
C143		C148	
C144		C149	
C145		C150	
C146		C151	

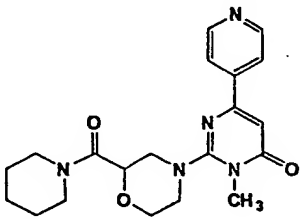
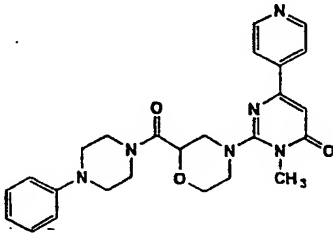
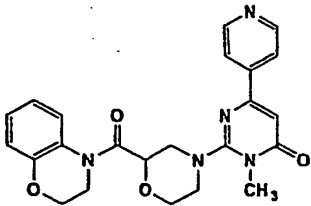
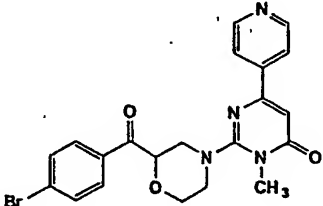
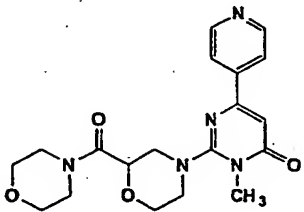
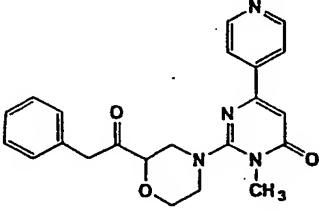
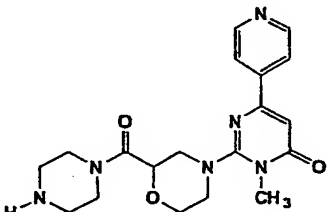
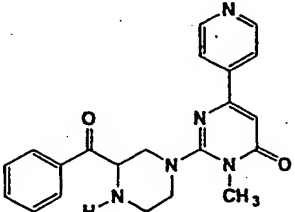
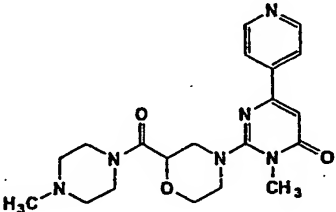
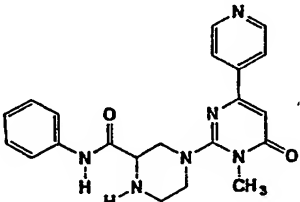
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C152		C157	
C153		C158	
C154		C159	
C155		C160	
C156		C161	

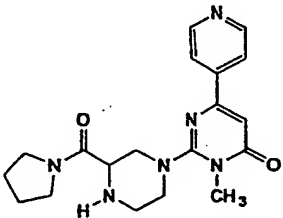
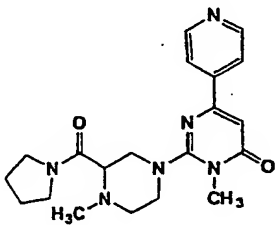
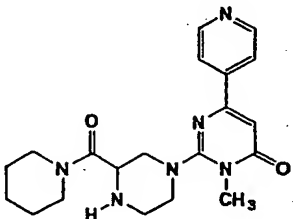
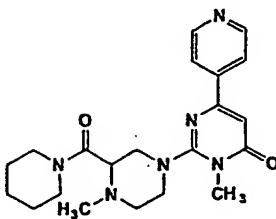
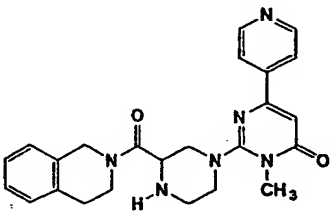
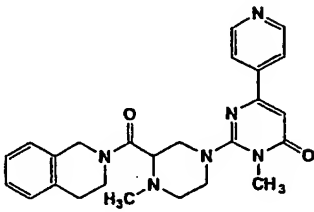
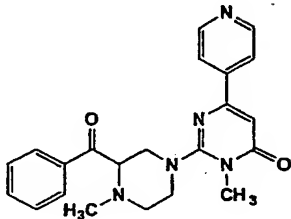
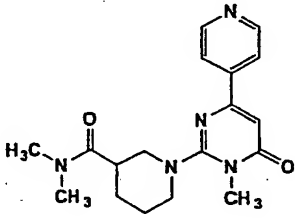
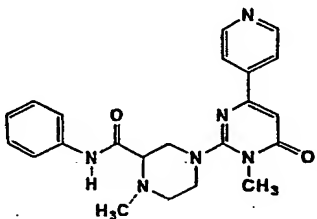
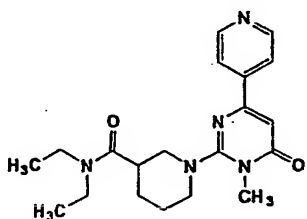


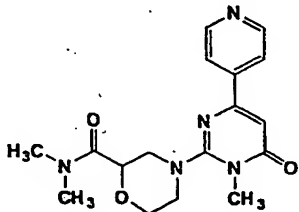
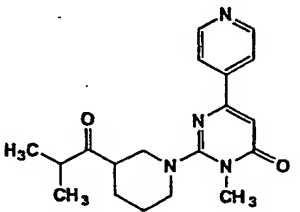
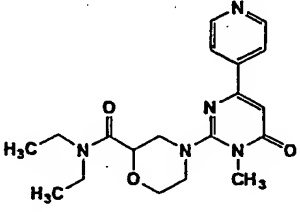
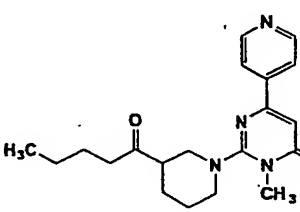
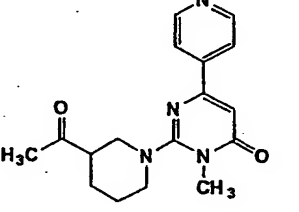
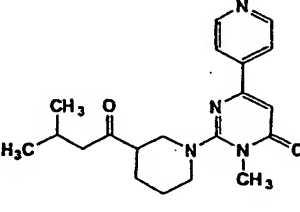
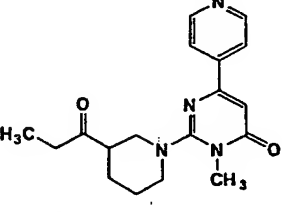
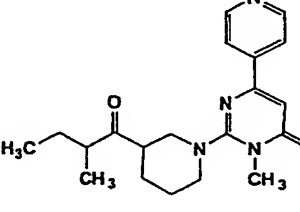
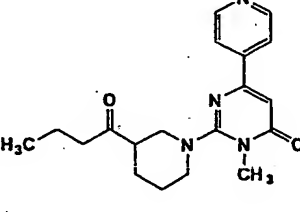
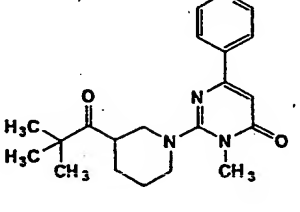
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C162		C167	
C163		C168	
C164		C169	
C165		C170	
C166		C171	

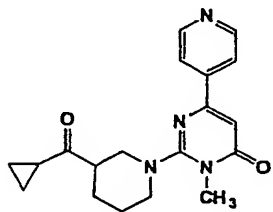
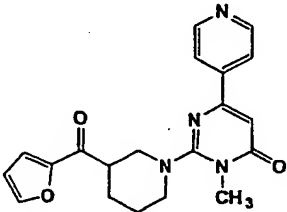
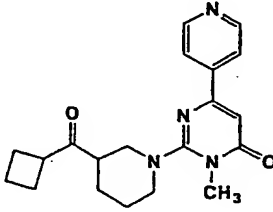
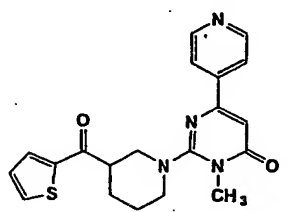
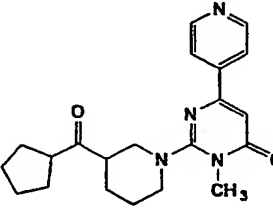
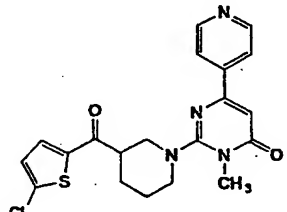
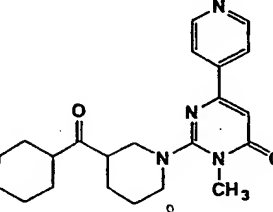
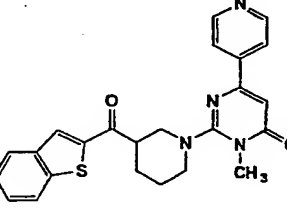
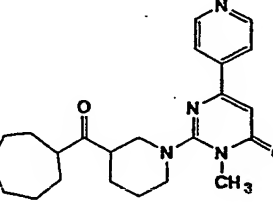
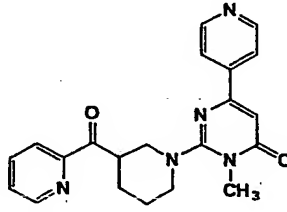
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C172		C177	
C173		C178	
C174		C179	
C175		C180	
C176		C181	

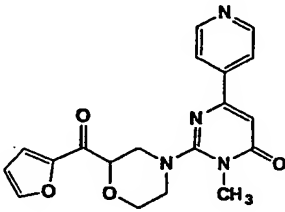
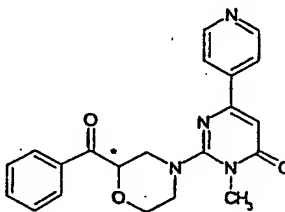
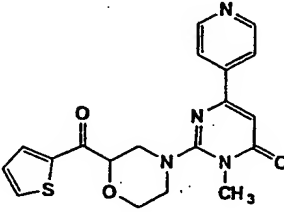
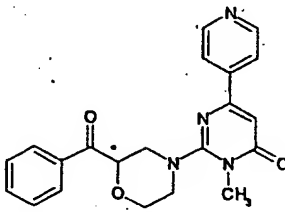
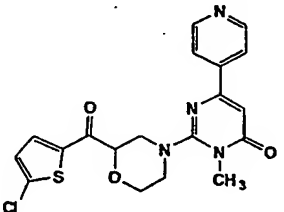
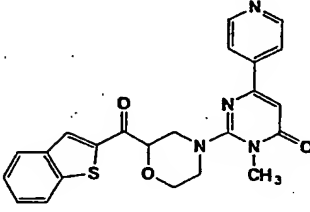
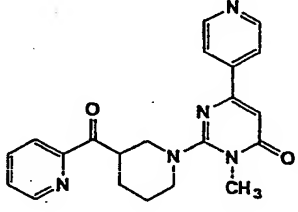
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C182		C187	
C183		C188	
C184		C189	
C185		C190	
C186		C191	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
C192		C197	
C193		C198	
C194		C199	
C195		C201	
C196		C202	

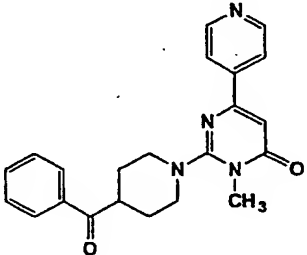
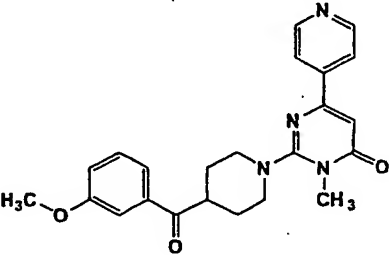
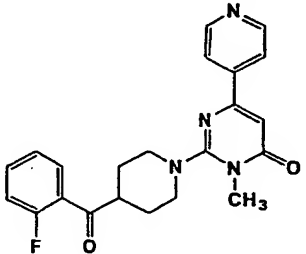
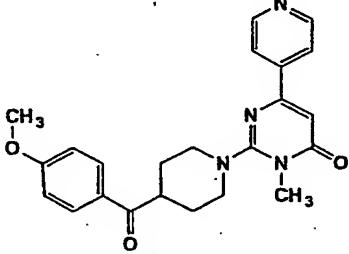
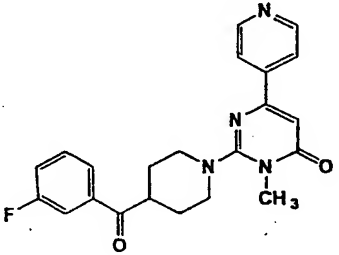
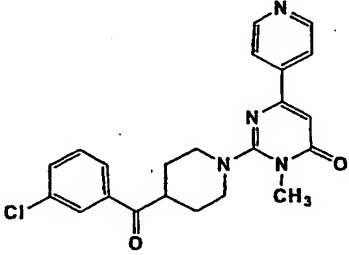
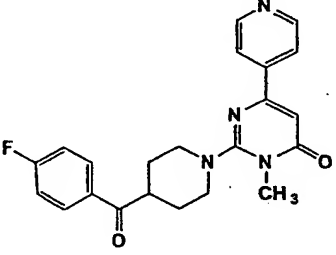
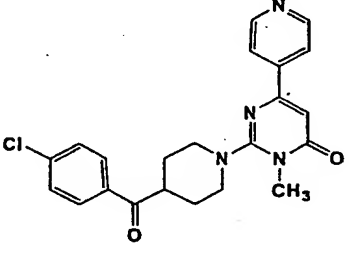
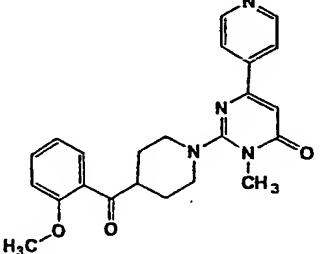
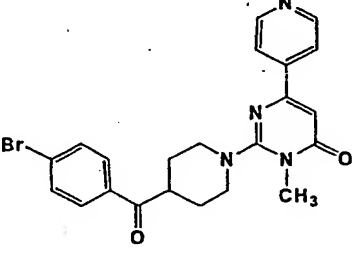
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C203		C208	
C204		C209	
C205		C210	
C206		C250	
C207		C251	

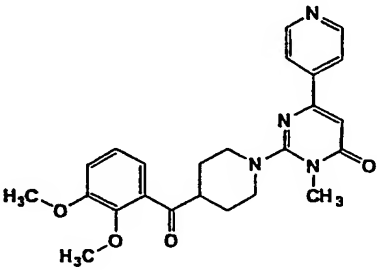
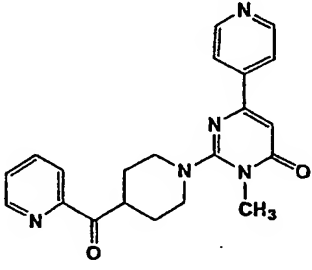
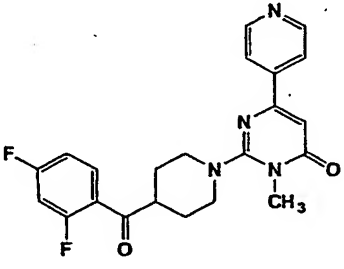
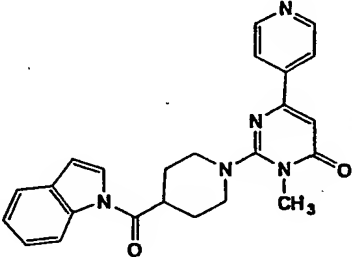
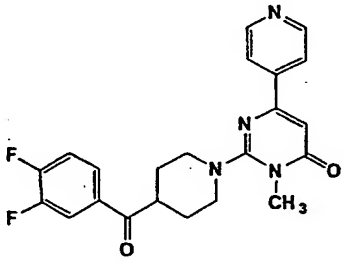
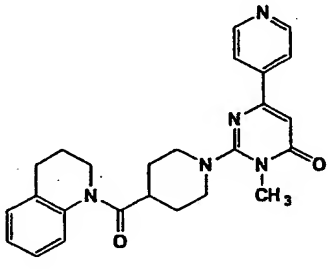
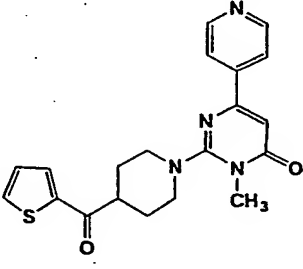
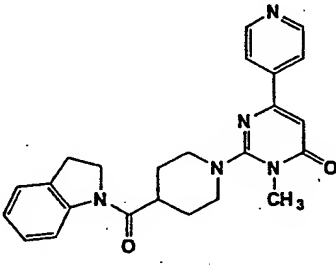
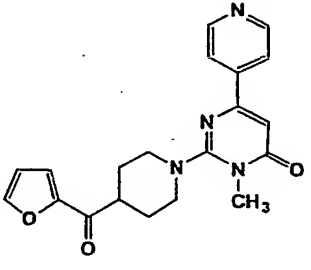
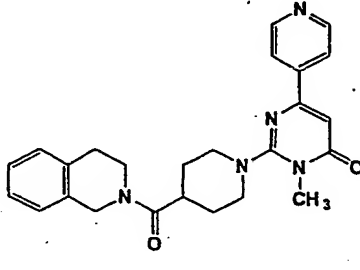
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C260		C354	
C261		C355	
C351		C356	
C352		C357	
C353		C358	

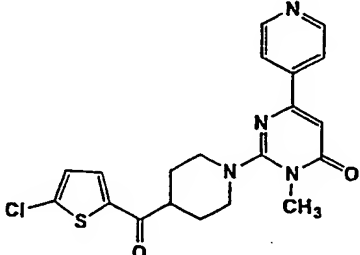
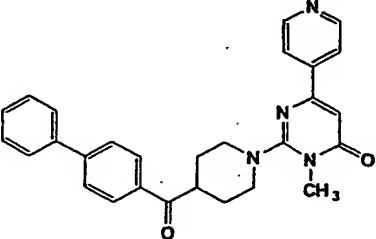
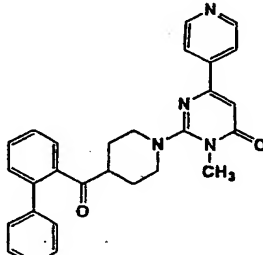
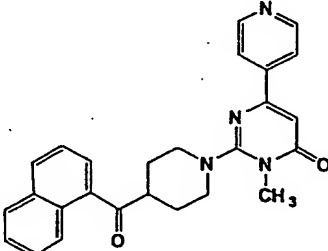
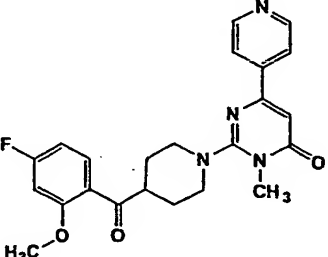
Compound No.	STRUCTURE	Compound No.	STRUCTURE
C359		C364	
C360		C365	
C361		C366	
C362		C367	
C363		C368	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
C384		C389	
C385		C390	
C386			
C387			
C388			



Compound No.	STRUCTURE	Compound No.	STRUCTURE
D001		D006	
D002		D007	
D003		D008	
D004		D009	
D005		D010	

Compound No.	STRUCTURE	Compound No.	STRUCTURE
D011		D016	
D012		D017	
D013		D018	
D014		D019	
D015		D020	

Compound No.	STRUCTURE		
D021			
D022			
D023			
D024			
D025			

Compound B288 and B289

## • Measurement condition

CHIRALPAK AD

Mobile phase: n-hexane : i-propanol = 80 : 20

Flow rate: 1.0 ml/min

Temperature: 30°C

## • Retention time

B288: 18.1 min

B289: 18.6 min

Compound C389 and C390

## • Measurement condition

CHIRALPAK AD

Mobile phase: n-hexane : i-propanol = 60 : 40

Flow rate: 1.0 ml/min

Temperature: 30°C

## • Retention time

C389: 12.0 min

C390: 14.7 min

Particularly preferred compounds of the present invention represented by formula (I) include:

3-methyl-2-(2-oxo-2-phenylethylamino)-6-pyridin-4-yl-3H-pyrimidin-4-one;

3-methyl-2-(2-oxo-2-(3-fluorophenyl)ethylamino)-6-pyridin-4-yl-3H-pyrimidin-4-one;

3-methyl-2-(2-oxo-2-(4-fluorophenyl)ethylamino)-6-pyridin-4-yl-3H-pyrimidin-4-one;

3-methyl-2-(2-oxo-2-(3-chlorophenyl)ethylamino)-6-pyridin-4-yl-3H-pyrimidin-4-one;

3-methyl-2-(2-oxo-2-(3-methylphenyl)ethylamino)-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(4-Fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
(*S*)-2-[2-(4-Fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(2-Fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
(*S*)-2-[2-(2-Fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(4-Chlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(3-Chlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(2-Chlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
(*S*)-2-[2-(2-Chlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(4-Bromophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
(*S*)-2-[2-(4-Bromophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(3-Bromophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
(*S*)-2-[2-(3-Bromophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(2-Bromophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(4-Methylphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(3-Methylphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(2-Methylphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
(*S*)-2-[2-(2-Methylphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(4-Cyanophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(3-Cyanophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
(*S*)-2-[2-(3-Cyanophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(2-Cyanophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(4-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
(*S*)-2-[2-(4-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
2-[2-(3-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
(*S*)-2-[2-(3-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

2-[2-(2-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;  
(*S*)-2-[2-(2-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

2-[2-(2-Ethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

2-[2-(2-Trifluoromethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

2-[2-(5-Fluoro-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

2-[2-(4-Fluoro-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

(*S*)-2-[2-(4-Fluoro-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

2-[2-(2,5-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

(*S*)-2-[2-(2,5-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

2-[2-(2-Chloro-4,5-difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

(*S*)-2-[2-(2-Chloro-4,5-difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

2-[2-(2-Bromo-4-fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

2-[2-(2,4-Difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

(*S*)-2-[2-(2,4-Difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

2-[2-(2,6-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one;

(S)-2-[2-(2,6-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,4-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,4-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,6-Dichlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,6-Dichlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,6-Difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,6-Difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2-Chloro-6-fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2-Chloro-6-fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(4-Fluoro-3-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(5-Cyano-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(5-Cyano-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(4-Cyano-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(4-Cyano-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,4-Difluoro-6-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

pyrimidin-4-one;

(S)-2-[2-(2,4-Difluoro-6-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(4-(Pyrrolidin-1-yl-methyl)phenyl)morpholino-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(4-(Pyrrolidin-1-yl-methyl)phenyl)morpholino-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(1-Naphthyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2-Naphthyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2-Naphthyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,3-Dihydrobenzofuran-7-yl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,3-Dihydrobenzofuran-7-yl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(Benzofuran-2-yl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(Benzofuran-2-yl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[3-(4-Fluorobenzoyl)piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-(3-Benzoylpiperidin-1-yl)-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[3-(2-Methoxybenzoyl)piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[3-(4-Methoxybenzoyl)piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(4-Fluorobenzoyl)morpholine-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-(2-Benzoylmorpholine-4-yl)-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2-Methoxybenzoyl)morpholine-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;



2-[2-(4-Methoxybenzoyl)morpholine-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one

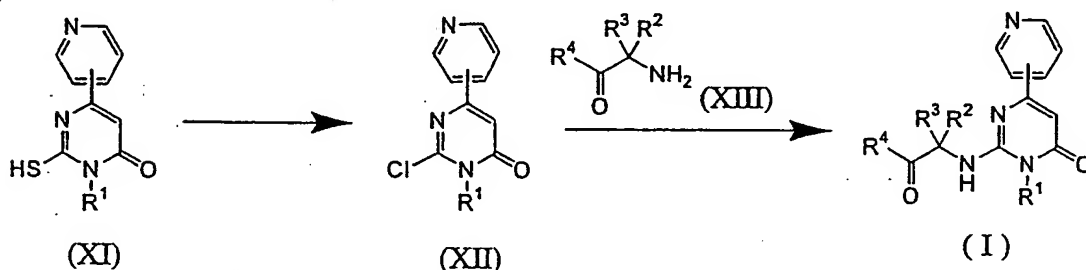
2-[4-(4-Chlorobenzoyl)piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[4-(3,4-Dihydro-2H-quinoline-1-carbonyl)-piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one; and

2-[4-(2,3-Dihydroindole-1-carbonyl)-piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one.

Salts of the aforementioned preferred compound, and solvates or hydrates of the aforementioned compounds and salts thereof are also preferred.

The 3-substituted-4-pyrimidone compounds represented by the aforementioned formula (I) wherein R is the group represented by formula (II) can be prepared, for example, according to the method explained below.



(In the above scheme, definitions of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are the same as those already described.)

The 2-thiopyrimidinone represented by the above formula (XI) is prepared easily by a modification of the method described in EP 354,179. The reaction is carried out in the presence of a base such as sodium hydroxide, potassium hydroxide, sodium methoxide, sodium ethoxide, potassium t-butoxide, sodium carbonate, sodium hydrogencarbonate, potassium carbonate, triethylamine, diisopropylethylamine, and 1,8-diazabicyclo[5,4,0]undec-7-en for 1 to 100 hours at a suitable temperature ranging

from 0°C to 200°C under nitrogen or argon atmosphere or under ordinary air to afford the desired compound (XI). Examples of a solvent for the reactions include, for example, alcoholic solvent such as methanol, ethanol, 1-propanol, isopropanol, tert-butanol, ethylene glycol, propylene glycol; etheric solvents such as diethyl ether, tert-butyl methyl ether, tetrahydrofuran, isopropyl ether; hydrocarbonic solvents such as benzene, toluene, xylene; halogenated hydrocarbonic solvents such as dichloromethane, chloroform, dichloroethane; aprotic polar solvents such as formamide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methylpyrrolidone, dimethyl sulfoxide, sulfolane, hexamethylphosphoric triamide, water and the like. Generally, a single solvent or a mixture of two or more solvents may be used so as to be suitable to a base used.

Then the 2-thiopyrimidone derivative (XI) is transformed into the 2-chloropyrimidone (XII) by a chlorinating agent. The reaction time and temperature depend on the chlorinating agent used. Examples of a chlorinating agent for the reactions include, for example, thionyl chloride, thionyl chloride and dimethylformamide, phosphorus oxychloride, phosphorus oxychloride and dimethylformamide, oxalyl chloride, phosphorous oxychloride and dimethylformamide, and phosphorus pentachloride.

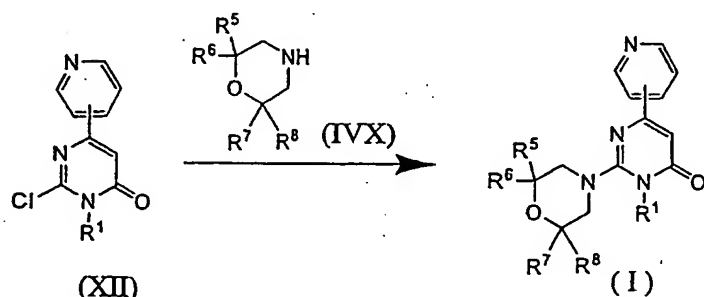
The amine represented by the above formula (XIII) or salts thereof is may be prepared by a modification of the method described in the literature (Tetrahedron Lett., 30, 5285 (1989), Synthesis, 122 (1990)).

Then the chloride derivative (XII) is allowed to react with the amine (XIII) or salts thereof in the presence of a base such as sodium hydroxide, potassium hydroxide, sodium methoxide, sodium ethoxide, sodium carbonate, sodium hydrogencarbonate, potassium carbonate, triethylamine, diisopropylethylamine, and 1,8-diazabicyclo[5,4,0]undec-7-en for 1 to 100 hours at a suitable temperature ranging from 0°C to 200°C under nitrogen or argon atmosphere or under ordinary air to afford

the desired compound (I). 4-Dimethylaminopyridine may be used as a catalyst.

Examples of a solvent for the reactions include, for example, alcoholic solvent such as methanol, ethanol, 1-propanol, isopropanol, tert-butanol, ethylene glycol, propylene glycol; etheric solvents such as diethyl ether, tert-butyl methyl ether, tetrahydrofuran, isopropyl ether; hydrocarbonic solvents such as benzene, toluene, xylene; halogenated hydrocarbonic solvents such as dichloromethane, chloroform, dichloroethane; aprotic polar solvents such as formamide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methylpyrrolidone, dimethyl sulfoxide, sulfolane, hexamethylphosphoric triamide, water and the like. Generally, a single solvent or a mixture of two or more solvents may be used so as to be suitable to a base used.

The 3-substituted-4-pyrimidone compounds represented by the aforementioned formula (I) wherein R is the group represented by formula (III) can be prepared, for example, according to the method explained below.



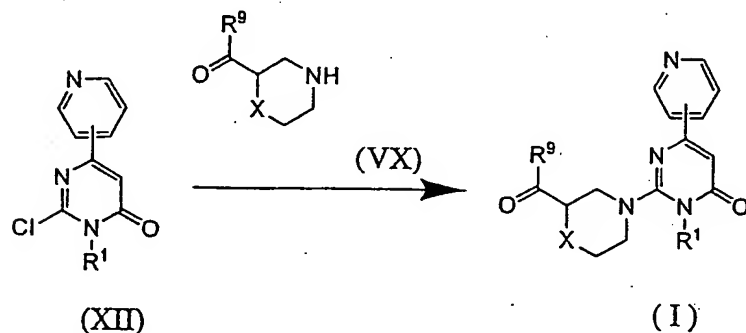
(In the above scheme, definitions of R<sup>1</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup> and R<sup>8</sup> are the same as those already described.)

The chloride derivative (XII) is allowed to react with the amine (IVX) or salts thereof in the presence of a base such as sodium hydroxide, potassium hydroxide, sodium methoxide, sodium ethoxide, sodium carbonate, sodium hydrogencarbonate, potassium carbonate, triethylamine, diisopropylethylamine, and 1,8-diazabicyclo[5.4.0]undec-7-en for 1 to 100 hours at a suitable temperature ranging from 0°C to 200°C under nitrogen or argon atmosphere or under ordinary air to afford

the desired compound ( I ).

Examples of a solvent for the reactions include, for example, alcoholic solvent such as methanol, ethanol, 1-propanol, isopropanol, tert-butanol, ethylene glycol, propylene glycol; etheric solvents such as diethyl ether, tert-butyl methyl ether, tetrahydrofuran, isopropyl ether; hydrocarbonic solvents such as benzene, toluene, xylene; halogenated hydrocarbonic solvents such as dichloromethane, chloroform, dichloroethane; aprotic polar solvents such as formamide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methylpyrrolidone, dimethyl sulfoxide, sulfolane, hexamethylphosphoric triamide, water and the like. Generally, a single solvent or a mixture of two or more solvents may be used so as to be suitable to a base used.

The 3-substituted-4-pyrimidone compounds represented by the aforementioned formula (I) wherein R is the group represented by formula (IV) can be prepared, for example, according to the method explained below.



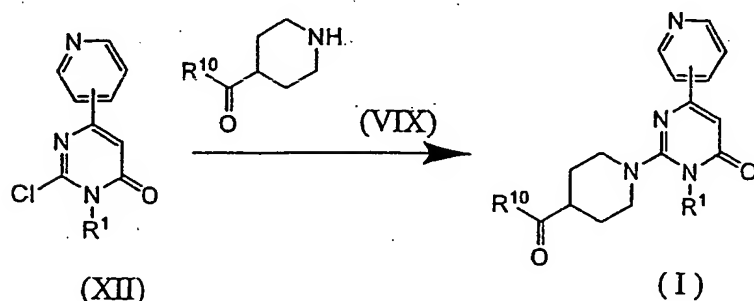
(In the above scheme, definitions of R<sup>1</sup>, R<sup>9</sup>, and X are the same as those already described.)

The amine represented by the above formula (VX) may be prepared by a modification of the method described in the literature (J. Med. Chem., 13, 1 (1970), J. Med. Chem., 41, 591 (1998)) or according to well-known methods of one skilled in the art.

Then the chloride derivative (XII) is allowed to react with the amine (VX) or salts thereof in the presence of a base such as sodium hydroxide, potassium hydroxide, sodium methoxide, sodium ethoxide, sodium carbonate, sodium hydrogencarbonate, potassium carbonate, triethylamine, diisopropylethylamine, and 1,8-diazabicyclo[5,4,0]undec-7-en for 1 to 100 hours at a suitable temperature ranging from 0°C to 200°C under nitrogen or argon atmosphere or under ordinary air to afford the desired compound (I).

Examples of a solvent for the reactions include, for example, alcoholic solvent such as methanol, ethanol, 1-propanol, isopropanol, tert-butanol, ethylene glycol, propylene glycol; etheric solvents such as diethyl ether, tert-butyl methyl ether, tetrahydrofuran, isopropyl ether; hydrocarbonic solvents such as benzene, toluene, xylene; halogenated hydrocarbonic solvents such as dichloromethane, chloroform, dichloroethane; aprotic polar solvents such as formamide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methylpyrrolidone, dimethyl sulfoxide, sulfolane, hexamethylphosphoric triamide, water and the like. Generally, a single solvent or a mixture of two or more solvents may be used so as to be suitable to a base used.

The 3-substituted-4-pyrimidone compounds represented by the aforementioned formula (I) wherein R is the group represented by formula (V) can be prepared, for example, according to the method explained below.



(In the above scheme, definitions of R<sup>1</sup> and R<sup>10</sup> are the same as those already described.)

The amine represented by the above formula (VIX) is commercially available or may be prepared by a modification of the method described in the literature (J. Med. Chem., 13, 1 (1970), J. Med. Chem., 41, 591 (1998)) or according to well-known methods of one skilled in the art.

Then the chloride derivative (XII) is allowed to react with the amine (VIX) or salts thereof in the presence of a base such as sodium hydroxide, potassium hydroxide, sodium methoxide, sodium ethoxide, sodium carbonate, sodium hydrogencarbonate, potassium carbonate, triethylamine, diisopropylethylamine, and 1,8-diazabicyclo[5,4,0]undec-7-en for 1 to 100 hours at a suitable temperature ranging from 0°C to 200°C under nitrogen or argon atmosphere or under ordinary air to afford the desired compound (I).

Examples of a solvent for the reactions include, for example, alcoholic solvent such as methanol, ethanol, 1-propanol, isopropanol, tert-butanol, ethylene glycol, propylene glycol; etheric solvents such as diethyl ether, tert-butyl methyl ether, tetrahydrofuran, isopropyl ether; hydrocarbonic solvents such as benzene, toluene, xylene; halogenated hydrocarbonic solvents such as dichloromethane, chloroform, dichloroethane; aprotic polar solvents such as formamide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methylpyrrolidone, dimethyl sulfoxide, sulfolane, hexamethylphosphoric triamide, water and the like. Generally, a single solvent or a mixture of two or more solvents may be used so as to be suitable to a base used.

The compounds of the present invention have inhibitory activity against TPK1, and they inhibit TPK1 activity in neurodegenerative diseases such as Alzheimer disease, thereby suppress the neurotoxicity of A $\beta$  and the formation of PHF and inhibit the nerve cell death. Accordingly, the compounds of the present invention are useful as an active ingredient of a medicament which radically enables preventive and/or therapeutic treatment of Alzheimer disease. In addition, the

compounds of the present invention are also useful as an active ingredient of a medicament for preventive and/or therapeutic treatment of ischemic cerebrovascular accidents, Down syndrome, cerebral bleeding due to solitary cerebral amyloid angiopathy, progressive supranuclear palsy, subacute sclerosing panencephalitis, postencephalitic parkinsonism, pugilistic encephalosis, Guam parkinsonism-dementia complex, Lewy body disease, Pick's disease, corticobasal degeneration frontotemporal dementia, vascular dementia, traumatic injuries, brain and spinal cord trauma, peripheral neuropathies, retinopathies and glaucoma, non-insulin dependent diabetes, obesity, manic depressive illness, schizophrenia, alopecia, breast cancer, non-small cell lung carcinoma, thyroid cancer, T or B-cell leukemia, and several virus-induced tumors.

As the active ingredient of the medicament of the present invention, a substance may be used which is selected from the group consisting of the compound represented by the aforementioned formula (I) and pharmacologically acceptable salts thereof, and solvates thereof and hydrates thereof. The substance, per se, may be administered as the medicament of the present invention, however, it is desirable to administer the medicament in a form of a pharmaceutical composition which comprises the aforementioned substance as an active ingredient and one or more of pharmaceutical additives. As the active ingredient of the medicament of the present invention, two or more of the aforementioned substance may be used in combination. The above pharmaceutical composition may be supplemented with an active ingredient of other medicament for the treatment of Alzheimer disease and the above-mentioned diseases.

A type of the pharmaceutical composition is not particularly limited, and the composition may be provided as any formulation for oral or parenteral administration. For example, the pharmaceutical composition may be formulated, for example, in the form of pharmaceutical compositions for oral administration such as granules, fine

granules, powders, hard capsules, soft capsules, syrups, emulsions, suspensions, solutions and the like, or in the form of pharmaceutical compositions for parenteral administrations such as injections for intravenous, intramuscular, or subcutaneous administration, drip infusions, transdermal preparations, transmucosal preparations, nasal drops, inhalants, suppositories and the like. Injections or drip infusions may be prepared as powdery preparations such as in the form of lyophilized preparations, and may be used by dissolving just before use in an appropriate aqueous medium such as physiological saline. Sustained-release preparations such as those coated with a polymer may be directly administered intracerebrally.

Types of pharmaceutical additives used for the manufacture of the pharmaceutical composition, content ratios of the pharmaceutical additives relative to the active ingredient, and methods for preparing the pharmaceutical composition may be appropriately chosen by those skilled in the art. Inorganic or organic substances, or solid or liquid substances may be used as pharmaceutical additives. Generally, the pharmaceutical additives may be incorporated in a ratio ranging from 1% by weight to 90% by weight based on the weight of an active ingredient.

Examples of excipients used for the preparation of solid pharmaceutical compositions include, for example, lactose, sucrose, starch, talc, cellulose, dextrin, kaolin, calcium carbonate and the like. For the preparation of liquid compositions for oral administration, a conventional inert diluent such as water or a vegetable oil may be used. The liquid composition may contain, in addition to the inert diluent, auxiliaries such as moistening agents, suspension aids, sweeteners, aromatics, colorants, and preservatives. The liquid composition may be filled in capsules made of an absorbable material such as gelatin. Examples of solvents or suspension mediums used for the preparation of compositions for parenteral administration, e.g. injections, suppositories, include water, propylene glycol, polyethylene glycol, benzyl alcohol, ethyl oleate, lecithin and the like. Examples of base materials used for



suppositories include, for example, cacao butter, emulsified cacao butter, lauric lipid, witepsol.

Dose and frequency of administration of the medicament of the present invention are not particularly limited, and they may be appropriately chosen depending on conditions such as a purpose of preventive and/or therapeutic treatment, a type of a disease, the body weight or age of a patient, severity of a disease and the like. Generally, a daily dose for oral administration to an adult may be 0.01 to 1,000 mg (the weight of an active ingredient), and the dose may be administered once a day or several times a day as divided portions, or once in several days. When the medicament is used as an injection, administrations may preferably be performed continuously or intermittently in a daily dose of 0.001 to 100 mg (the weight of an active ingredient) to an adult.

#### Examples

The present invention will be explained more specifically with reference to examples. However, the scope of the present invention is not limited to the following examples. The compound number in the examples corresponds to that in the table above.

#### Example 1: Synthesis of 2-mercapto-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one

A solution of ethyl 3-oxo-3-(4-pyridyl)propionate (29.0 g, 150 mmol), *N*-methyl thiourea (40.6 g, 450 mmol) and 1,8-diazabicyclo[5,4,0]-7-undecene (22.4 ml, 150 mmol) was refluxed for 4 hours and the solution of methanesulfonic acid (14.4 g, 150 mmol) in water (50 ml) was added after cooling by ice-water. The precipitate was washed with water, filtered and dried to give the title compound (23.7 g, 72%).

<sup>1</sup>H-NMR (DMSO-*d*<sub>6</sub>)  $\delta$ : 3.58(s, 3H), 6.40(s, 1H), 7.72(dd, *J*=1.8, 4.5Hz, 2H), 8.73(dd, *J*=1.5, 4.8Hz, 2H), 12.92(brd, 1H).

Example 2: Synthesis of 2-chloro-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one

Phosphorous oxychloride (26.11g, 170 mmol) was added to dimethylformamide(180 ml) and stirred 20 min. 2-mercapto-3-methyl-6-(4-pyridyl)-pyrimidine-4-one(24.15 g, 110 mmol) was added to the solution and stirred 5 min and then stirred at 70°C for 2 hours. Ethyl acetate (630 ml) was added to the ice-cooled solution and precipitate was collected by filtration after 20 minutes stirring. After drying, the precipitate was dissolved in water (400 ml) and pH was adjusted to 10 by aqueous sodium hydroxide. The precipitate was washed with water, filtered and dried to give the title compound (18.82 g, 77%).  
<sup>1</sup>H-NMR (CDCl<sub>3</sub>) δ : 3.72(s, 3H), 6.90(s, 1H), 7.78(dd, J=1.7, 4.5Hz, 2H), 8.75(dd, J=1.6, 4.5Hz, 2H).

Example 3: Synthesis of 3-methyl-2-(2-oxo-2-phenylethylamino)-6-pyridin-4-yl-3*H*-pyrimidin-4-one (Compound No. A001 in Table-1)

A solution of 2-amino-1-phenyl-ethanone hydrochloride (1.03 g, 6.00mmol), 2-chloro-3-methyl-6-(4-pyridyl)-pyrimidine-4-one (0.665 g, 3.00 mmol), 4-dimethylaminopyridine (36.0 mg, 0.30mmol) and triethylamine (0.80 ml, 6.00 mmol) in dimethylsulfoxide (15 ml) was stirred at room temperature. After stirring for several hours, water was added to the reaction mixture. The precipitate was filtered and washed with refluxing diethyl ether to give the title compound (0.556 g, 68%).

<sup>1</sup>H-NMR (CDCl<sub>3</sub>) δ : 3.41(s, 3H), 4.90(d, J=5.1Hz, 2H), 6.46(s, 1H), 7.50-7.65(m, 2H), 7.67-7.80(m, 3H), 7.90(t, J=5.1Hz, 1H), 8.08(m, 2H), 8.47(dd, J=1.5Hz, 4.8Hz, 2H).

MS[M+H]<sup>+</sup>: 321.

Example 4: Synthesis of (S)-2-[2-(4-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-

pyridin-4-yl-3*H*-pyrimidin-4-one (Compound No. B079 in Table-1)

A solution of (S)-2-(4-methoxyphenyl)morpholine hydrochloride (1.02 g, 4.44 mmol), 2-chloro-3-methyl-6-(4-pyridyl)-pyrimidine-4-one (0.76 g, 3.42 mmol) and triethylamine (1.42 ml, 10.3 mmol) in tetrahydrofuran (20 ml) was refluxed for several hours. The precipitate was filtered off after cooling and solvent was removed in vacuo. The residue was washed with refluxing diethyl ether to give the title compound (1.22 g, 95%).

<sup>1</sup>H-NMR (DMSO-d<sub>6</sub>) δ : 2.98-3.06(m, 1H), 3.15-3.22(m, 1H), 3.47(s, 3H), 3.69-3.73(m, 2H), 3.76(s, 3H), 3.85-3.92(m, 1H), 4.04-4.08(m, 1H), 4.67-4.70(m, 1H), 6.95(d, J=8.5Hz, 2H), 7.10(s, 1H), 7.38(d, J=8.5Hz, 2H), 8.49(d, J=6.0Hz, 2H), 8.94(d, J=6.0Hz, 2H).

MS[M+H]<sup>+</sup> : 379

Example 5: Synthesis of 2-[2,2-Dimethyl-6-(4-Fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3*H*-pyrimidin-4-one (Compound No. B214 in Table-1)

A solution of 2,2-dimethyl-6-(4-fluorophenyl)morpholine hydrochloride (127 mg, 0.517 mmol), 2-chloro-3-methyl-6-(4-pyridyl)-pyrimidine-4-one (109 mg, 0.491 mmol) and triethylamine (0.180 ml, 1.29 mmol) in N,N-dimethylformamide (2 ml) was stirred at room temperature. After stirring for several hours, water was added to the reaction mixture. The precipitate was filtered, washed with water and dried to give the title compound (166 mg, 81%).

<sup>1</sup>H-NMR (CDCl<sub>3</sub>) δ : 1.39(s, 3H), 1.51(s, 3H), 2.86-3.02(m, 2H), 3.39(m, 1H), 3.60(s, 3H), 3.65(m, 1H), 5.04(m, 1H), 6.69(s, 1H), 7.09(m, 2H), 7.42(m, 2H), 7.79 (d, J = 6.0Hz, 2H), 8.72 (d, J = 6.0Hz, 2H).

MS[M+H]<sup>+</sup> : 394

Example 6: Synthesis of 2-(3-Benzoylpiperidin-1-yl)-3-methyl-6-pyridin-4-yl-3*H*-

pyrimidin-4-one (Compound No. C001 in Table-1)

A solution of 3-benzoylpiperidine hydrochloride (109 mg, 0.60 mmol), 2-chloro-3-methyl-6-(4-pyridyl)-pyrimidine-4-one (118 mg, 0.40 mmol) and triethylamine (0.50 ml, 4.00 mmol) in tetrahydrofuran(6 ml) was stirred at room temperature for several hours. The reaction mixture was poured into water and extracted with ethyl acetate. The organic layer was washed with brine, dried over  $\text{Na}_2\text{SO}_4$  and evaporated *in vacuo*. Purification of the residue by silica gel column chromatography (ethyl acetate) gave the title compound (182 mg, 61%).

Example 7: Synthesis of 1-(1-Methyl-6-oxo-4-pyridin-4-yl-1,6-dihydro-pyrimidine-2-yl)-piperidine-3-carboxanilide (Compound No. C067 in Table-1)

A solution of 1-*t*-butoxycarbonyl-3-piperidinecarboxylic acid (458 mg, 2.00 mmol), sodium hydride (88 mg, 2.20 mmol, 60% oil suspension), oxalyl chloride (0.22 ml, 2.50 mmol) and catalytic amount of dimethylformamide (0.20 ml) in dichloromethane(16 ml) was stirred at 0 °C. After stirring for 30 min, aniline(0.20 ml, 2.20 mmol) which was treated with *n*-butyl lithium(1.45 ml, 2.30 mmol, 1.59 M in hexane) in tetrahydrofuran(4 ml) was added to the reaction mixture at 0 °C. After additional 30 min, saturated ammonium hydrochloride was added and the whole reaction mixture was extracted with ethyl acetate. The organic layer was washed with brine, dried over  $\text{Na}_2\text{SO}_4$  and evaporated *in vacuo*. Purification of the residue by silica gel column chromatography (hexane-ethyl acetate) gave 1-*t*-butoxycarbonylpiperidine-3-carboxanilide (437 mg, 71%).

A solution of 1-*t*-butoxycarbonyl-3-piperidinecarboxanilide (437 mg, 1.43 mmol) and hydrochloride (1 ml, 4.00 mmol, 4N ethyl acetate) was stirred for several hours. Filtration of the precipitate gave 3-piperidinecarboxanilide hydrochloride (187 mg, 55%).

A solution of 3-piperidinecarboxanilide hydrochloride (96.0 mg, 0.40 mmol),

2-chloro-3-methyl-6-(4-pyridyl)-pyrimidine-4-one (66.0 mg, 0.30 mmol) and triethylamine (0.33 ml, 2.50 mmol) in tetrahydrofuran(3 ml) was stirred at room temperature for 3 hours. The whole reaction mixture was evaporated *in vacuo* and the precipitate was washed with water and diethyl ether to give the title compound (107 mg, 92%).

Example 8: Synthesis of 2-(2-benzoylmorpholin-4-yl)-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one (Compound No. C101 in Table-1)

Grignard's reagent was prepared by reaction of magnesium(932 mg, 5.93mmol) with bromobenzene(144 mg,5.93 mmol) in diethyl ether(20 ml) at room temperature for 10 min. After cooling to 0°C, a solution of 2-cyano-4-benzylmorpholine(1.00 g, 4.94 mmol) in diethyl ether(2.0 ml) was added and then tetrahydrofuran(6.0 ml) was added. The mixture was stirred at room temperature for 30 min. After decomposition with saturated aqueous sodium hydrogen carbonate, the mixture was filtered and concentrated under reduced pressure. The crude product was purified by flash chromatography on silica gel (n-hexane-ethyl acetate 3:1 to 2:1) to give the 2-benzoyl-4-benzylmorpholine(608 mg,44%).  
(CDCl<sub>3</sub>): 2.20-2.40(m, 2H), 2.60-2.80(m, 1H), 3.00-3.20(m, 1H), 3.55(dd, J=13.0, 27.8Hz, 2H), 3.70-3.90(m, 1H), 3.90-4.20(m, 1H), 4.92(dd, J=2.6,9.9Hz, 1H), 7.20-7.60(m, 8H), 7.80-8.00(m, 2H).

A solution of 2-benzoyl-4-benzylmorpholine (600 mg, 2.13 mmol) and chloroformic acid 1-chloromethyl ester (457 mg, 3.20 mmol) in 1,2-dichloroethane(8.0 ml) was refluxed for 1h. The reaction mixture was concentrated under reduced pressure. The residue was dissolved in methanol(10 ml). The solution was refluxed for 1h and concentrated under reduced pressure. The crude product was crystallized from ethyl acetate and filtrated to give 2-benzoylmorpholine hydrochloride (323 mg, 67%) as a colorless crystal.

(DMSO- $d_6$ ): 3.00-3.50(m, 4H), 4.00-4.20(m, 2H), 5.29(dd,  $J=2.6, 10.1$ Hz, 1H), 7.50-8.10(m, 5H), 9.40-9.90(brd, 2H).

A solution of 2-benzoylmorpholine hydrochloride (269 mg, 1.17 mmol), 2-chloro-3-methyl-6-(4-pyridyl)-pyrimidine-4-one (320 mg, 1.41 mmol) and triethylamine (0.49 ml, 3.51 mmol) in tetrahydrofuran(10 ml) was refluxed for several hours. The precipitate was filtered off after cooling and solvent was removed in vacuo. The residue was washed with refluxing ethyl acetate and diethyl ether to give the title compound (447 mg, quant.).

Example 9: Synthesis of 2-(4-benzoylpiperidin-1-yl)-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one (Compound No. D001 in Table-1)

A solution of 4-benzoylpiperidine hydrochloride (903 mg, 4.00 mmol), 2-chloro-3-methyl-6-(4-pyridyl)-pyrimidine-4-one (666 mg, 3.00 mmol) and triethylamine (2.0 ml, 15 mmol) in tetrahydrofuran(30 ml) was refluxed for several hours. After cooling, water was added to the reaction mixture. The precipitate was filtered, washed with water and dried to give the title compound (1.00 g, 81%).

Example 10: Synthesis of 2-[4-(4-Chlorobenzoyl)piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one (Compound No. D009 in Table-1)

A solution of (4-Chlorobenzoyl)piperidine hydrochloride (55 mg, 0.226 mmol), 2-chloro-3-methyl-6-(4-pyridyl)-pyrimidine-4-one (50 mg, 0.226 mmol) and triethylamine (0.160 ml, 1.15 mmol) in N,N-dimethylformamide(1 ml) was stirred at 60°C. After stirring for several hours, water was added to the reaction mixture. The precipitate was filtered, washed with water and dried to give the title compound (76 mg, 86%).

The compounds in the following table were prepared in the same manner as

the methods described above. The compound numbers in the following table correspond to those shown in the above-described table of preferred compounds.

Table 2

Compound No.	<sup>1</sup> H-NMR (Solvent) δ :	[M+H] <sup>+</sup>
A002	(CDCl <sub>3</sub> ): 3.59(s, 3H), 5.00(dd, J=3.8, 3.8Hz, 2H), 6.19(brs, 1H), 6.50(s, 1H), 7.24-7.37(m, 2H), 7.67(m, 1H), 7.78(d, J=5.1Hz, 2H), 8.04(m, 1H), 8.68(d, J=5.1Hz, 2H).	339
A003	(CDCl <sub>3</sub> ): 3.60(s, 3H), 5.02(d, J=3.9Hz, 2H), 6.06(brs, 1H), 6.50(s, 1H), 7.26-7.88(m, 6H), 7.71(d, J=5.4Hz, 2H).	338
A004	(CDCl <sub>3</sub> ): 3.41(s, 3H), 4.89(s, 2H), 6.48(s, 1H), 7.42(m, 2H), 7.70(dd, J=1.5Hz, 4.5Hz, 2H), 7.92(br, 1H), 8.18(m, 2H), 8.49(dd, J=1.5Hz, 4.5Hz, 2H).	339
A006	(DMSO): 3.39(s, 3H), 4.88(d, J=5.1Hz, 2H), 6.46(s, 1H), 7.58-8.08(m, 6H), 7.67(m, 1H), 8.48(d, J=5.1Hz, 2H).	355
A012	(CDCl <sub>3</sub> ): 2.48(s, 3H), 3.60(s, 3H), 5.01(d, J=3.9Hz, 2H), 6.22(brs, 1H), 6.48(s, 1H), 7.43-7.49(m, 2H), 7.79(dd, J=4.5, 1.8Hz, 2H), 7.86-7.89(m, 2H), 8.67(dd, J=4.5, 1.8Hz, 2H).	335
B008	(CDCl <sub>3</sub> ): 0.99(s, 9H), 2.89(m, 1H), 3.10-3.65(m, 4H), 3.53(s, 3H), 3.76(m, 1H), 4.04(m, 1H), 6.68(s, 1H), 7.80(d, J=6.0Hz, 2H), 8.72(d, J=6.0Hz, 2H).	328
B009	(CDCl <sub>3</sub> ): 2.74(dd, J=13.7, 7.4Hz, 1H), 2.87(dd, J=12.7, 10.4Hz, 1H), 3.02(dd, J=13.7, 6.2Hz, 1H), 3.24(td, J=12.2, 3.0Hz, 1H), 3.39(s, 3H), 3.48(dd, J=15.1, 1.6Hz, 2H), 3.77(td, J=11.7, 2.4Hz, 2H), 3.91(m, 1H), 4.03(dd, J=11.6, 2.0Hz, 1H), 6.65(s, 1H), 7.24-7.37(m, 5H), 7.71(dd, J=6.0, 1.5Hz, 2H), 8.70(dd, J=6.0, 1.5Hz, 2H).	363
B010	(CDCl <sub>3</sub> ): 1.81(m, 1H), 1.93(m, 1H), 2.76(m, 1H), 2.89(m, 1H), 3.19(td, J=11.6, 3.1Hz, 1H), 3.44(m, 2H), 3.49(s, 3H), 3.65(m, 1H), 3.81(td, J=11.5, 2.0Hz, 1H), 4.06(dt, J=10.7, 1.1Hz, 1H), 6.68(s, 1H), 7.21-7.34(m, 5H), 7.77(dd, J=4.6, 1.5Hz, 2H), 8.73(dd, J=4.6, 1.5Hz, 2H).	377
B011	(CDCl <sub>3</sub> ): 1.49-1.90(m, 4H), 2.67(d, J=7.2Hz, 2H), 2.83(dd, J=12.8, 10.5Hz, 1H), 3.15(td, J=11.9, 2.8Hz, 1H), 3.45(d, J=12.8Hz, 2H), 3.52(s, 3H), 3.65(m, 1H), 3.79(dd, J=11.4, 2.1Hz, 1H), 4.01(dd, J=11.1, 1.5Hz, 1H), 6.68(s, 1H), 7.18-7.33(m, 5H), 7.79(dd, J=4.5, 1.5Hz, 2H), 8.71(dd, J=4.8, 1.5Hz, 2H).	391

B012	(CDCl <sub>3</sub> ) : 3.10-3.33(m, 2H), 3.50(m, 1H), 3.71-4.20(m, 6H), 6.70(s, 1H), 6.89-7.03(m, 3H), 7.24-7.36(m, 2H), 7.80(d, J = 6.0Hz, 2H), 8.71 (d, J = 6.0Hz, 2H).	378
B027	(DMSO-d <sub>6</sub> ) : 3.01(m, 1H), 3.15(m, 1H), 3.47(s, 3H), 3.73(dd, J=13.5, 13.5Hz, 2H), 3.90(dd, J=10.9, 10.9Hz, 1H), 4.07(d, J=11.0Hz, 1H), 4.74(d, J=9.3Hz, 1H), 7.06(s, 1H), 7.30-7.47(m, 5H), 8.40(d, J= 6.3Hz, 2H), 8.90 (d, J = 6.3Hz, 2H).	349
B028	(DMSO-d <sub>6</sub> ) : 3.01(m, 1H), 3.15(m, 1H), 3.47(s, 3H), 3.73(dd, J=13.4, 13.4Hz, 2H), 3.90(dd, J=11.6, 11.6Hz, 1H), 4.07(d, J=10.1Hz, 1H), 4.74(d, J=9.3Hz, 1H), 7.07(s, 1H), 7.30-7.46(m, 5H), 8.43(d, J= 6.3Hz, 2H), 8.92 (d, J = 6.3Hz, 2H).	349
B029	(DMSO-d <sub>6</sub> ) : 3.02(m, 1H), 3.15(m, 1H), 3.47(s, 3H), 3.74(dd, J=13.4, 13.4Hz, 2H), 3.90(dd, J=11.7, 11.7Hz, 1H), 4.07(d, J=11.2Hz, 1H), 4.74(d, J=9.3Hz, 1H), 7.07(s, 1H), 7.30-7.47(m, 5H), 8.44(d, J= 6.3Hz, 2H), 8.92 (d, J = 6.3Hz, 2H).	349
B030	(DMSO-d <sub>6</sub> ) : 3.00(dd, J=12.9, 10.8, 1H), 3.18(m, 1H), 3.47(s, 3H), 3.73(dd, J=12.3, 12.3Hz, 2H), 3.89(dd, J=9.9, 9.9Hz, 1H), 4.07(d, J=11.2Hz, 1H), 4.75(d, J=9.3Hz, 1H), 7.04(s, 1H), 7.18-7.24(m, 2H), 7.47-7.52(m, 2H), 8.40(d, J= 6.6Hz, 2H), 8.90 (d, J = 6.6Hz, 2H).	367
B031	(DMSO-d <sub>6</sub> ) : 3.01(dd, J=12.9, 10.8, 1H), 3.18(m, 1H), 3.47(s, 3H), 3.74(dd, J=12.0, 12.0Hz, 2H), 3.91(dd, J=11.7, 11.7Hz, 1H), 4.08(d, J=10.5Hz, 1H), 4.75(d, J=9.3Hz, 1H), 7.05(s, 1H), 7.19-7.26(m, 2H), 7.48-7.54(m, 2H), 8.38(d, J= 6.3Hz, 2H), 8.90 (d, J = 6.3Hz, 2H).	367
B032	(DMSO-d <sub>6</sub> ) : 3.01(dd, J=12.9, 10.8, 1H), 3.19(m, 1H), 3.47(s, 3H), 3.73(dd, J=11.4, 11.4Hz, 2H), 3.91(dd, J=11.4, 11.4Hz, 1H), 4.08(d, J=11.4Hz, 1H), 4.75(d, J=9.3Hz, 1H), 7.04(s, 1H), 7.19-7.26(m, 2H), 7.48-7.54(m, 2H), 8.36(d, J= 6.3Hz, 2H), 8.89 (d, J = 6.3Hz, 2H).	367
B033	(DMSO-d <sub>6</sub> ) : 3.00(m, 1H), 3.18(m, 1H), 3.47(s, 3H), 3.73-4.10(m, 4H), 4.77(d, J=9.4Hz, 1H), 7.05(s, 1H), 7.13-7.48(m, 4H), 8.38(d, J= 6.0Hz, 2H), 8.89 (d, J = 6.0Hz, 2H).	367
B036	(DMSO-d <sub>6</sub> ) : 3.06(m, 1H), 3.22(m, 1H), 3.47(s, 3H), 3.68-4.11(m, 4H), 5.05(d, J=9.3Hz, 1H), 7.06(s, 1H), 7.22-7.61(m, 4H), 8.40(d, J= 6.3Hz, 2H), 8.90 (d, J = 6.3Hz, 2H).	367
B037	(DMSO-d <sub>6</sub> ) : 3.04(m, 1H), 3.23(m, 1H), 3.46(s, 3H), 3.66-4.09(m, 4H), 5.04(d, J=9.6Hz, 1H), 7.05(s, 1H), 7.20-7.59(m, 4H), 8.39(d, J= 6.0Hz, 2H), 8.88 (d, J = 6.0Hz, 2H).	367



B038	(DMSO-d <sub>6</sub> ) : 3.07(m, 1H), 3.24(m, 1H), 3.48(s, 3H), 3.69-4.10(m, 4H), 5.05(d, J=9.3Hz, 1H), 7.10(s, 1H), 7.21-7.61(m, 4H), 8.49(d, J= 6.3Hz, 2H), 8.94 (d, J = 6.3Hz, 2H).	367
B039	(DMSO-d <sub>6</sub> ):2.97(dd, J=11.0, 12.6Hz, 1H), 3.12-3.20(m, 1H), 3.45(s, 3H), 3.68-3.77(m, 2H), 3.85-3.92(m, 1H), 3.99-4.08(m, 1H), 4.73-4.76(m, 1H), 7.08(s, 1H), 7.42-7.49(m, 4H), 8.47(d, J=5.7Hz, 2H), 8.93(d, J=5.9Hz, 2H).	383
B042	(DMSO-d <sub>6</sub> ) : 3.02(dd, J=12.5, 10.9, 1H), 3.19(m, 1H), 3.48(s, 3H), 3.71-4.11(m, 4H), 4.78(d, J=8.9Hz, 1H), 7.08(s, 1H), 7.38-7.53(m, 4H), 8.44(d, J= 6.3Hz, 2H), 8.92 (d, J = 6.3Hz, 2H).	383
B045	(DMSO-d <sub>6</sub> ) : 2.93(dd, J=12.8, 10.6, 1H), 3.23(m, 1H), 3.39(s, 3H), 3.69-4.15(m, 4H), 5.06(d, J=9.0Hz, 1H), 7.14(s, 1H), 7.38-7.66(m, 4H), 8.56(d, J= 6.3Hz, 2H), 8.98 (d, J = 6.3Hz, 2H).	383
B046	(DMSO-d <sub>6</sub> ) : 2.89(m, 1H), 3.35(m, 1H), 3.50(s, 3H), 3.68-4.14(m, 4H), 5.06(m, 1H), 7.08(s, 1H), 7.39-7.64(m, 4H), 8.46(d, J= 5.5Hz, 2H), 8.93 (d, J = 5.5Hz, 2H).	382
B048	□(DMSO-d <sub>6</sub> ) : 2.96(1H, dd, J=10.7, 12.7 Hz), 3.12-3.20(1H, m), 3.45(3H, s), 3.66-3.75(2H, m), 3.86-3.93(1H, m), 4.05-4.09(1H, m), 4.75(1H, d, J=8.9 Hz), 6.85(1H, s), 7.42(2H, d, J=8.4 Hz), 7.58(2H, d, J=8.3 Hz), 7.97(2H, d, J=6.0 Hz), 8.69(2H, d, J=6.0 Hz)	[M+]=427
B051	(DMSO-d <sub>6</sub> ) : 2.94-3.02(1H, m), 3.14-3.22(1H, m), 3.46(3H, s), 3.66-3.77(2H, m), 3.87-3.94(1H, m), 4.04-4.09(1H, m), 4.76(1H, d, J=9.5 Hz), 6.85(1H, s), 7.33-7.38(1H, m), 7.46-7.48(1H, m), 7.52-7.55(1H, m), 7.61-7.70(1H, m), 7.97(2H, d, J=5.7 Hz), 8.68(2H, d, J=5.7 Hz)	427
B054	(DMSO-d <sub>6</sub> ) : 2.90(dd, J=12.6, 10.5, 1H), 3.22(m, 1H), 3.51(s, 3H), 3.67-4.15(m, 4H), 4.98(d, J=9.0Hz, 1H), 7.07(s, 1H), 7.29-7.68(m, 4H), 8.42(d, J=6.3Hz, 2H), 8.90 (d, J=6.3Hz, 2H).	427
B057	(DMSO-d <sub>6</sub> ) : 3.00(dd, J=12.6, 10.5, 1H), 3.18(m, 1H), 3.47(s, 3H), 3.69-4.09(m, 4H), 4.70(d, J=9.3Hz, 1H), 7.06(s, 1H), 7.20(d, J=7.8Hz, 2H), 7.34(d, J=7.8Hz, 2H), 8.41(d, J= 6.3Hz, 2H), 8.91(d, J=6.3Hz, 2H).	363
B060	(DMSO-d <sub>6</sub> ): 2.33(s, 3H), 2.97-3.05(m, 1H), 3.15-3.22(m, 1H), 3.48(s, 3H), 3.70-3.77(m, 1H), 3.86-3.94(m, 1H), 4.05-4.09(m, 1H), 4.69-4.72(m, 1H), 7.07(s, 1H), 7.13-7.28(m, 4H), 8.43(d, J=6.0Hz, 2H), 8.92(d, J=6.3Hz, 2H).	363
B063	(CDCl <sub>3</sub> ) : 2.41(s, 3H), 3.08(m, 1H), 3.35(m, 1H), 3.54(m, 1H), 3.59(s, 3H), 3.66(m, 1H), 4.00(m, 1H), 4.21(m, 1H), 4.92(m, 1H), 6.69(s, 1H), 7.18-7.29(m, 3H), 7.55(m, 1H), 7.79 (d, J= 5.5Hz, 2H), 8.71 (d, J = 5.5Hz, 2H).	363

B064	(CDCl <sub>3</sub> ): 2.41(s, 3H), 3.08(m, 1H), 3.35(m, 1H), 3.52-3.69(m, 2H), 3.60(s, 3H), 4.00(m, 1H), 4.21(m, 1H), 4.92(m, 1H), 6.69(s, 1H), 7.18-7.29(m, 3H), 7.53(m, 1H), 7.79 (d, J= 6.3Hz, 2H), 8.70 (d, J = 6.0Hz, 2H).	362
B066	(DMSO-d <sub>6</sub> ): 3.11(dd, J=10.8, 12.8Hz, 1H), 3.24-3.32(m, 1H), 3.47(s, 3H), 3.68-3.75(m, 2H), 3.90-3.98(m, 1H), 4.10-4.14(m, 1H), 4.96-4.99(m, 1H), 7.11(s, 1H), 7.60(t, J=7.4Hz, 1H), 7.77-7.79(m, 2H), 7.90(d, J=8.0Hz, 1H), 8.48(d, J=6.0Hz, 2H), 8.94(d, J=6.1Hz, 2H).	417
B069	(DMSO-d <sub>6</sub> ): 3.04(m, 1H), 3.19(m, 1H), 3.48(s, 3H), 3.50-4.15(m, 4H), 4.87(d, J=8.7Hz, 1H), 7.04(s, 1H), 7.67(d, J=8.1Hz, 2H), 7.88(d, J=8.1Hz, 2H), 8.35(d, J=6.6Hz, 2H), 8.88(d, J=6.6Hz, 2H).	374
B072	(DMSO-d <sub>6</sub> ): 3.02(m, 1H), 3.20(m, 1H), 3.49(s, 3H), 3.74(d, J=13.2Hz, 2H), 3.82(d, J=12.3Hz, 2H), 3.94(m, 1H), 4.11(d, J=11.1Hz, 1H), 4.83(d, J=9.9Hz, 2H), 7.08(s, 1H), 7.62(t, J=7.8Hz, 1H), 7.82(d, J=7.8Hz, 2H), 7.92(s, 1H), 8.43(d, J=5.7Hz, 2H), 8.92(d, J=5.7Hz, 2H).	374
B073	(DMSO-d <sub>6</sub> ): 3.06(m, 1H), 3.12-3.85(m, 6H), 3.94(m, 1H), 4.11(d, J=9.9Hz, 1H), 4.83(d, J=9.0Hz, 1H), 7.00(s, 1H), 7.62(m, 1H), 7.83(d, J=7.8Hz, 2H), 7.92(s, 1H), 8.27(d, J=5.4Hz, 2H), 8.84(d, J=5.4Hz, 2H).	373
B075	(DMSO-d <sub>6</sub> ): 3.09(m, 1H), 3.19-3.33(m, 1H), 3.49(s, 3H), 3.69(d, J=12.6Hz, 1H), 3.83(d, J=12.6Hz, 1H), 3.97(m, 1H), 4.12(d, J=11.7Hz, 1H), 5.02(dd, J=2.4Hz, 10.5Hz, 1H), 6.86(s, 1H), 7.58(m, 1H), 7.73-7.82(m, 2H), 7.90(d, J=7.5Hz, 1H), 7.99(dd, J=1.5Hz, 6.0Hz, 2H), 8.67(dd, J=1.5Hz, 6.0Hz, 2H).	373
B078	(DMSO-d <sub>6</sub> ): 3.01(m, 1H), 3.18(m, 1H), 3.47(s, 3H), 3.68-3.73(m, 2H), 3.75(s, 3H), 3.88(m, 1H), 4.06(m, 1H), 4.68(d, J=9.6Hz, 1H), 6.94(d, J=8.4Hz, 2H), 7.09(s, 1H), 7.37(d, J=8.4Hz, 2H), 8.46(d, J= 6.0Hz, 2H), 8.94(d, J=6.0Hz, 2H).	379
B080	(DMSO-d <sub>6</sub> ): 2.95-3.03(m, 1H), 3.12-3.20(m, 1H), 3.45(s, 3H), 3.67-3.71(m, 2H), 3.73(s, 3H), 3.82-3.90(m, 1H), 4.02-4.05(m, 1H), 4.64-4.67(m, 1H), 6.92(d, J=8.5Hz, 2H), 7.08(s, 1H), 7.35(d, J=8.5Hz, 2H), 8.49(d, J=6.2Hz, 2H), 8.96(d, J=6.0Hz, 2H).	379
B081	(DMSO-d <sub>6</sub> ): 3.02(m, 1H), 3.15(m, 1H), 3.48(s, 3H), 3.70-3.75(m, 2H), 3.77(s, 3H), 3.90(m, 1H), 4.08(m, 1H), 4.73(d, J=9.6Hz, 1H), 6.89-7.04(m, 3H), 7.10(s, 1H), 7.31(m, 1H), 8.47(d, J= 5.7Hz, 2H), 8.94(d, J=5.7Hz, 2H).	379

B082	(DMSO-d <sub>6</sub> ): 2.99-3.06(m, 1H), 3.16-3.23(m, 1H), 3.48(s, 3H), 3.70-3.74(m, 2H), 3.77(s, 3H), 3.86-3.94(m, 1H), 4.07-4.10(m, 1H), 4.71-4.74(m, 1H), 6.89-6.92(m, 1H), 7.01(s, 1H), 7.06(m, 2H), 7.31(t, J=7.8Hz, 1H), 8.45(d, J=5.9Hz, 2H), 8.93(d, J=5.9Hz, 2H).	378
B084	(DMSO-d <sub>6</sub> ): 2.82(dd, J=10.2, 12.8Hz, 1H), 3.17-3.26(m, 1H), 3.50(s, 3H), 3.68-3.72(m, 1H), 3.83(s, 3H), 3.83-3.94(m, 2H), 4.09-4.13(m, 1H), 5.00-5.03(m, 1H), 6.98-7.07(m, 2H), 7.14(s, 1H), 7.29-7.35(m, 1H), 7.45(d, J=7.4Hz, 1H), 8.59(d, J=6.4Hz, 2H), 9.00(d, J=6.4Hz, 2H).	379
B085	(CDCl <sub>3</sub> ): 2.83(1H, dd, J=10.2, 12.9Hz), 3.3-3.4(1H, m), 3.5-3.6(1H, m), 3.62(3H, s), 3.8-3.9(1H, m), 3.86(3H, m), 4.0-4.1(1H, m), 4.2-4.3(1H, m), 5.08(1H, dd, J=2.1, 10.2Hz), 6.69(1H, s), 7.0-7.1(1H, m), 7.2-7.3(1H, m), 7.53(1H, dd, J=1.5, 7.8Hz), 7.82(1H, dd, J=1.5, 4.5Hz), 8.71(2H, dd, 1.5, 4.5Hz)	379
B087	(DMSO-d <sub>6</sub> ): 1.30(3H, t, J=6.8 Hz), 2.75(1H, dd, J=10.6, 12.5 Hz), 3.17-3.25(1H, m), 3.48(3H, s), 3.66-3.71(1H, m), 3.77-3.81(1H, m), 3.89-3.96(1H, m), 4.01-4.13(3H, m), 4.96(1H, d, J=9.3 Hz), 6.84(1H, s), 6.95-7.03(2H, m), 7.25-7.31(1H, m), 7.42-7.44(1H, m), 7.98(2H, d, J=5.1 Hz), 8.68(2H, d, J=5.3 Hz)	393
B088	(CDCl <sub>3</sub> ): 2.90(m, 1H), 3.35(m, 1H), 3.55(m, 1H), 3.62(s, 3H), 3.69(m, 1H), 4.03(m, 1H), 4.24(m, 1H), 5.05(m, 1H), 6.71(s, 1H), 7.26-7.40(m, 3H), 7.68(m, 1H), 7.80 (d, J = 6.0Hz, 2H), 8.71 (d, J = 6.0Hz, 2H).	433
B089	(CDCl <sub>3</sub> ): 2.80(m, 1H), 3.37(m, 1H), 3.53-3.73(m, 2H), 3.60(s, 3H), 4.05(m, 1H), 4.21-4.58(m, 3H), 5.08(m, 1H), 6.70(s, 1H), 6.86(d, 1H, J=8.2Hz), 7.14(m, 1H), 7.32(m, 1H), 7.59(m, 1H), 7.80 (d, J = 6.0Hz, 2H), 8.71 (d, J = 6.0Hz, 2H).	447
B090	(DMSO-d <sub>6</sub> ): 2.82(dd, J=10.2, 12.8Hz, 1H), 3.19-3.26(m, 1H), 3.49(s, 3H), 3.67-3.71(m, 1H), 3.83(s, 3H), 3.81-3.94(m, 2H), 4.09-4.12(m, 1H), 4.98-5.01(m, 1H), 7.05-7.23(m, 4H), 8.51(d, J=5.4Hz, 2H), 8.96(d, J=6.4Hz, 2H).	397
B091	(DMSO-d <sub>6</sub> ): 2.81(m, 1H), 3.20(m, 1H), 3.47(s, 3H), 3.56-3.91(m, 2H), 3.83(s, 3H), 4.08(m, 1H), 4.95(d, J=9.3Hz, 1H), 6.78-6.98(m, 2H), 7.09(s, 1H), 7.43(m, 1H), 8.49(d, J=5.4Hz, 2H), 8.94(d, J=5.4Hz, 2H).	397
B092	(DMSO-d <sub>6</sub> ): 2.94-3.01(1H, m), 3.13-3.20(1H, m), 3.46(3H, s), 3.67-3.78(2H, m), 3.88-3.95(1H, m), 4.07-4.10(1H, m), 4.79(1H, d, J=9.8 Hz), 6.86(1H, s), 7.47(1H, d, J=8.3 Hz), 7.65-7.72(2H, m), 7.98(2H, d, J=5.7 Hz), 8.68(2H, d, J=5.5 Hz)	417

B093	(DMSO-d <sub>6</sub> ): 2.78(1H, dd, J=10.3, 12.7 Hz), 3.16-3.24(1H, m), 3.46(3H, s), 3.62-3.66(1H, m), 3.71(3H, s), 3.78(3H, s), 3.83-4.11(2H, m), 4.97(1H, d, J=9.0 Hz), 6.84(1H, s), 6.85-6.88(1H, m), 6.95-7.00(2H, m), 7.99(2H, d, J=5.6 Hz), 8.69(2H, d, J=5.9 Hz)	409
B094	(DMSO-d <sub>6</sub> ): 2.78-2.86(m, 1H), 3.17-3.25(m, 1H), 3.49(s, 3H), 3.66-3.93(m, 3H), 3.72(s, 3H), 3.78(s, 3H), 4.09-4.13(m, 1H), 4.96-4.99(m, 1H), 6.85-7.09(m, 4H), 8.48(d, J=5.4Hz, 2H), 8.94(d, J=6.0Hz, 2H).	408
B096	(CDCl <sub>3</sub> ): 3.07(t, J = 10.6Hz, 1H), 3.29(td, J = 10.3, 3.2Hz, 1H), 3.53(d, J = 12.2Hz, 1H), 3.58(s, 3H), 3.68(dt, J = 13.1, 1.1Hz, 1H), 3.96(td, J = 11.9, 2.3Hz, 1H), 4.19(dd, J = 13.9, 2.3Hz, 1H), 4.75(dd, J = 10.4, 1.1Hz, 2H), 6.72(s, 1H), 6.80(tt, J = 8.9, 2.3Hz, 1H), 6.96(dd, J = 6.0, 2.3Hz, 2H), 7.79(dd, J = 4.6, 1.6Hz, 2H), 8.73(dd, J = 4.5, 1.6Hz, 2H).	385
B097	(CDCl <sub>3</sub> ): 2.78(dd, J = 12.8, 10.4Hz, 1H), 3.32(td, J = 12.2, 3.2Hz, 1H), 3.54(d, J = 12.5Hz, 1H), 3.62(s, 3H), 3.82(dt, J = 12.9, 1.9Hz, 1H), 4.02(td, J = 11.8, 2.3Hz, 1H), 4.23(dd, J = 11.6, 2.2Hz, 1H), 5.02(dd, J = 10.3, 1.9Hz, 2H), 6.71(s, 1H), 7.24(dd, J = 6.9, 2.8Hz, 1H), 7.50(dd, J = 11.2, 8.4Hz, 1H), 7.80(dd, J = 4.6, 1.5Hz, 2H), 8.70(dd, J = 4.5, 1.5Hz, 2H).	419
B098	(CDCl <sub>3</sub> ): 2.78(dd, J = 12.8, 10.4Hz, 1H), 3.32(td, J = 12.2, 3.2Hz, 1H), 3.54(d, J = 12.5Hz, 1H), 3.62(s, 3H), 3.82(dt, J = 12.9, 1.9Hz, 1H), 4.02(td, J = 11.8, 2.3Hz, 1H), 4.23(dd, J = 11.6, 2.2Hz, 1H), 5.02(dd, J = 10.3, 1.9Hz, 2H), 6.71(s, 1H), 7.24(dd, J = 6.9, 2.8Hz, 1H), 7.50(dd, J = 11.2, 8.4Hz, 1H), 7.80(dd, J = 4.6, 1.5Hz, 2H), 8.70(dd, J = 4.5, 1.5Hz, 2H).	418
B100	(DMSO-d <sub>6</sub> ): 2.90(dd, J=10.5Hz, 12.9Hz, 1H), 3.23(m, 1H), 3.51(s, 3H), 3.70(d, J=13.2Hz, 1H), 3.85(d, J=12.9Hz, 1H), 3.95(m, 1H), 4.12(d, J=9.6Hz, 1H), 4.96(d, J=8.7Hz, 1H), 7.11(s, 1H), 7.37(m, 1H), 7.60-7.70(m, 2H), 8.50(d, J=6.3Hz, 2H), 8.95(d, J=6.6Hz, 2H).	446
B101	(DMSO-d <sub>6</sub> ): 3.07(dd, J=12.8, 10.6, 1H), 3.24(m, 1H), 3.47(s, 3H), 3.67-4.09(m, 4H), 5.01(d, J=9.4Hz, 1H), 7.06(s, 1H), 7.17(m, 1H), 7.32(m, 1H), 7.61(m, 1H), 8.41(d, J= 6.3Hz, 2H), 8.90(d, J=6.3Hz, 2H).	384
B102	(DMSO-d <sub>6</sub> ): 3.22(t, J=14.4Hz, 1H), 3.58(d, J=19.5Hz, 1H), 3.77(s, 3H), 3.26-4.04(m, 4H), 5.29(d, J=9.0Hz, 1H), 6.67(d, J=8.4Hz, 2H), 7.02(s, 1H), 7.27(t, J=8.4Hz, 1H), 8.44(d, J=5.7Hz, 2H), 8.92(d, J=5.7Hz, 2H).	408
B103	(DMSO-d <sub>6</sub> ): 3.22(1H, t, J=14.4Hz), 3.58(1H, d, J=19.5Hz), 3.77(3H, s), 3.26-4.04(4H, m), 5.29(1H, d, J=9.0Hz), 6.67(2H, d, J=8.4Hz), 7.02(1H, s), 7.27(1H, t, J=8.4Hz), 8.44(2H, d, J=5.7Hz), 8.92(2H, d, J=5.7Hz).	409

B104	d(DMSO-d <sub>6</sub> ): 3.22(1H, t, J=14.4Hz), 3.58(1H, d, J=19.5Hz), 3.77(3H, s), 3.26-4.04(4H, m), 5.29(1H, d, J=9.0Hz), 6.67(2H, d, J=8.4Hz), 7.02(1H, s), 7.27(1H, t, J=8.4Hz), 8.44(2H, d, J=5.7Hz), 8.92(2H, d, J=5.7Hz).	409
B105	(DMSO-d <sub>6</sub> ): 3.44-3.63(m, 2H), 3.58(s, 3H), 3.81(m, 1H), 3.98(m, 1H), 4.21(m, 1H), 5.55(dd, J=2.7Hz, 11.1Hz, 1H), 6.69(s, 1H), 7.20(t, J=7.5Hz, 1H), 7.35(d, J=7.5Hz, 2H), 7.82(d, J=4.5Hz, 2H), 8.70(d, J=4.5Hz, 2H).	416
B106	(CDCl <sub>3</sub> ): 3.44-3.55(3H, m), 3.59(3H, s), 3.82(1H, dd, J=12.9, 10.8Hz), 3.98(1H, m), 4.20(1H, m), 5.55(1H, dd, J=10.8, 2.7Hz), 6.70(1H, s), 7.18-7.38(3H, m), 7.82(2H, dd, J=4.5, 1.5Hz), 8.71(2H, dd, J=4.5, 1.8Hz).	417
B107	(CDCl <sub>3</sub> ): 3.44-3.55(3H, m), 3.59(3H, s), 3.82(1H, dd, J=12.9, 10.8Hz), 3.98(1H, m), 4.20(1H, m), 5.55(1H, dd, J=10.8, 2.7Hz), 6.70(1H, s), 7.18-7.38(3H, m), 7.82(2H, dd, J=4.5, 1.5Hz), 8.71(2H, dd, J=4.5, 1.8Hz).	417
B108	(DMSO-d <sub>6</sub> ): 3.03(t, J=12.6Hz, 1H), 3.20(t, J=11.1Hz, 1H), 3.48(s, 3H), 3.70-3.78(m, 2H), 3.90(m, 1H), 4.05(m, 1H), 4.73(d, J=10.2Hz), 7.03(m, 1H), 7.06(s, 1H), 7.18-7.25(m, 2H), 8.40(d, J=5.7Hz, 2H), 8.90(d, J=5.7Hz, 2H).	396
B109	(CDCl <sub>3</sub> ): 3.42-3.52(2H, m), 3.57(3H, s), 3.63-3.66(2H, m), 3.67(1H, m), 4.13(1H, m), 5.24(1H, dd, J=9.0, 1.8Hz), 6.70(1H, s), 6.95(2H, m), 7.32(1H, m), 7.82(2H, dd, J=4.5, 1.8Hz), 8.72(2H, dd, J=4.5, 1.8Hz).	410
B110	(CDCl <sub>3</sub> ): 3.42-3.52(2H, m), 3.57(3H, s), 3.63-3.66(2H, m), 3.67(1H, m), 4.13(1H, m), 5.24(1H, dd, J=9.0, 1.8Hz), 6.70(1H, s), 6.95(2H, m), 7.32(1H, m), 7.82(2H, dd, J=4.5, 1.8Hz), 8.72(2H, dd, J=4.5, 1.8Hz).	385
B112	(CDCl <sub>3</sub> ): 1.74-1.79(m, 4H), 2.50-2.53(m, 4H), 3.13(m, 1H), 3.32(m, 1H), 3.51-3.68(m, 2H), 3.64(s, 3H), 3.67(s, 2H), 4.00(m, 1H), 4.18(m, 1H), 4.72(m, 1H), 6.70(s, 1H), 7.33-7.44(m, 4H), 7.80(dd, J=4.8, 1.2Hz, 2H), 8.71(dd, J=4.8, 1.2Hz, 2H).	432
B113	(CDCl <sub>3</sub> ): 1.80-1.82(4H, m), 2.56-5.58(4H, m), 3.12(1H, dd, J=13.2, 10.8Hz), 3.32(1H, m), 3.54(1H, m), 3.58(3H, s), 3.64(1H, m), 3.68(2H, s), 3.98-4.21(2H, m), 4.73(1H, dd, J=10.5, 2.1Hz), 6.69(1H, s), 7.35-7.42(4H, m), 7.79(2H, d, J=4.5, 1.5Hz), 8.71(2H, d, J=4.5, 1.5Hz).	431
B115	(D <sub>2</sub> O): 1.24-1.39(1H, m), 1.46-1.67(3H, m), 1.75-1.80(2H, m), 2.78-2.86(2H, m), 3.14-3.34(4H, m), 3.44(3H, s), 3.66-3.72(2H, m), 3.91-4.06(2H, m), 4.16(2H, s), 4.79(1H, d, J=10.4 Hz), 6.83(1H, s), 7.35-7.47(4H, m), 8.44(2H, d, J=6.5 Hz), 8.72(2H, d, J=6.6 Hz).	446

B116	(D <sub>2</sub> O): 1.81-1.96(2H, m), 2.00-2.16(2H, m), 3.03-3.15(2H, m), 3.19-3.31(2H, m), 3.39-3.47(2H, m), 3.50(3H, s), 3.70-3.78(2H, m), 3.95-4.11(2H, m), 4.31(2H, s), 4.85(2H, d, J=10.3Hz), 6.89(1H, s), 7.41-7.56(4H, m), 8.49(2H, d, J=6.0 Hz), 8.77(2H, d, J=6.7 Hz)	432
B117	(D <sub>2</sub> O): 2.74(6H, s), 3.17-3.34(2H, m), 3.48(3H, s), 3.68-3.76(2H, m), 3.97-4.09(2H, m), 4.23(2H, s), 4.83(1H, d, J=9.9 Hz), 6.87(1H, s), 7.39-7.52(4H, m), 8.46(2H, d, J=7.1 Hz), 8.75(2H, d, J=6.6 Hz)	406
B118	(D <sub>2</sub> O): 3.11-3.25(4H, m), 3.31-3.36(2H, m), 3.48(3H, s), 3.62-3.76(4H, m), 3.98-4.06(4H, m), 4.30(2H, s), 4.83(1H, d, J=8.9 Hz), 6.87(1H, s), 7.41-7.52(4H, m), 8.47(2H, d, J=6.8 Hz), 8.76(2H, d, J=6.6 Hz)	448
B119	(CDCl <sub>3</sub> ): 1.61-1.78(4H, m), 2.34-2.48(4H, m), 3.06(1H, dd, J=10.5, 12.9 Hz), 3.24-3.28(1H, m), 3.35-3.45(1H, m), 3.54(3H, s), 3.68-3.81(2H, m), 3.98-4.02(1H, m), 4.03-4.20(2H, m), 5.05(1H, dd, J=2.1, 10.2 Hz), 6.68(1H, s), 7.25-7.26(2H, m), 7.32-7.36(1H, m), 7.57-7.60(1H, m), 7.81(2H, d, J=6.3 Hz), 8.72(2H, d, J=6.0 Hz)	431
B120	(CDCl <sub>3</sub> ): 1.31(3H, d, J=6.0Hz), 1.37(3H, d, J=6.1Hz), 2.76(1H, dd, J=10.1, 12.6Hz), 3.3-3.5(1H, m), 3.5-3.7(1H, m), 3.63(3H, s), 3.7-3.8(1H, m), 4.0-4.2(1H, m), 4.2-4.3(1H, m), 4.6-4.7(1H, m), 5.02(1H, dd, J=2.0, 10.1Hz), 6.68(1H, s), 6.88(1H, d, J=8.3Hz), 6.98(1H, t, J=7.4Hz), 7.2-7.3(1H, m), 7.52(1H, dd, J=1.6, 7.6Hz), 7.81(1H, dd, J=1.6, 4.5 Hz), 8.71(2H, dd, 1.5, 4.5Hz)	407
B122	(CDCl <sub>3</sub> ): 1.34(6H, d, J=6.0Hz), 3.13(1H, dd, J=10.8, 12.9Hz), 3.2-3.4(1H, m), 3.5-3.7(2H, m), 3.57(3H, s), 3.9-4.0(1H, m), 4.1-4.2(1H, m), 4.5-4.6(1H, m), 4.66(1H, dd, J=2.1, 10.5Hz), 6.69(1H, s), 6.9-7.0(2H, m), 7.3-7.4(2H, m), 7.79(2H, dd, J=1.8, 4.5Hz), 8.71(2H, dd, J=1.8, 4.5Hz).	407
B126	(CDCl <sub>3</sub> ): 0.3-0.4(2H, m), 0.6-0.7(2H, m), 1.2-1.3(1H, m), 2.79(1H, d, J=10.2, 12.9Hz), 3.3-3.5(1H, m), 3.6-3.7(1H, m), 3.65(3H, s), 3.7-4.0(3H, m), 4.0-4.1(1H, m), 4.2-4.3(1H, m), 5.09(1H, dd, J=2.1, 10.2Hz), 6.68(1H, s), 6.84(2H, d, J=8.1Hz), 7.03(2H, t, J=7.5Hz), 7.2-7.3(1H, m), 7.53(1H, dd, J=1.5, 7.5Hz), 7.81(1H, dd, J=1.5, 4.5Hz), 8.71(2H, dd, 1.5, 4.5Hz)	419
B128	(CDCl <sub>3</sub> ): 0.3-0.4(2H, m), 0.6-0.7(2H, m), 1.2-1.3(1H, m), 3.12(1H, d, J=10.8, 12.9Hz), 3.2-3.4(1H, m), 3.5-3.7(2H, m), 3.57(3H, s), 3.82(2H, d, J=6.9Hz), 3.9-4.0(1H, m), 4.1-4.2(1H, m), 4.67(1H, dd, J=2.4, 10.8Hz), 6.69(1H, s), 6.93(2H, d, J=8.7Hz), 7.32(2H, d, J=8.7Hz), 7.79(2H, dd, J=1.8, 4.8Hz), 8.71(2H, dd, J=1.8, 4.8Hz).	419

B130	(DMSO-d <sub>6</sub> ): 2.98(1H, dd, J=12.6, 14.4 Hz), 3.18-3.24(1H, m), 3.22(3H, s), 3.46(3H, s), 3.69(1H, d, J=12.3 Hz), 3.81(1H, d, J=12.9 Hz), 3.89-3.96(1H, m), 4.10(1H, d, J=10.5 Hz), 4.89(1H, d, J=9.0 Hz), 6.83(1H, s), 7.67(1H, t, J=7.8 Hz), 7.80(1H, d, J=7.5 Hz), 7.88(1H, d, J=6.9 Hz), 7.96(2H, d, J=5.1 Hz), 8.00(1H, s), 8.67(2H, d, J=5.1 Hz)	427
B140	(CDCl <sub>3</sub> ): 2.0-2.1(4H, m), 3.16(1H, dd, J=10.7, 12.8 Hz), 3.2-3.4(5H, m), 3.5-3.7(2H, m), 3.56(3H, s), 3.9-4.0(1H, m), 4.1-4.2(1H, m), 4.61(1H, dd, J=2.1, 10.7 Hz), 6.57(2H, d, J=8.4 Hz), 6.69(1H, s), 7.26(2H, d, J=8.7 Hz), 7.80(2H, dd, J=1.4, 4.6 Hz), 8.71(2H, dd, J=1.4, 4.6 Hz)	418
B143	(CDCl <sub>3</sub> ): 3.18(1H, dd, J=12.3, 10.1 Hz), 3.35(1H, m), 3.59(1H, m), 3.60(3H, s), 3.72(1H, m), 3.98-4.23(2H, m), 4.79(1H, d, J=10.5), 6.70(1H, s), 7.35-7.65(9H, m), 7.80(2H, d, J=5.7 Hz), 8.72(2H, d, J=5.7 Hz).	425
B184	(DMSO-d <sub>6</sub> ): 1.99-2.06(2H, m), 2.82-2.89(4H, m), 2.98(1H, dd, J=10.7, 12.9 Hz), 3.11-3.22(1H, m), 3.45(3H, s), 3.65-3.70(2H, m), 3.84-3.92(1H, m), 4.01-4.06(1H, m), 4.79(1H, d, J=8.7 Hz), 6.83(1H, s), 7.17-7.23(2H, m), 7.29-7.32(1H, m), 7.96(2H, d, J=6.2 Hz), 8.66(2H, d, J=6.0 Hz)	389
B185	(DMSO-d <sub>6</sub> ): 3.07(1H, dd, J=10.9, 12.3 Hz), 3.18-3.27(1H, m), 3.49(3H, s), 3.70-3.74(1H, m), 3.81-3.86(1H, m), 3.93-4.00(1H, m), 4.11-4.15(1H, m), 4.93(1H, d, J=9.5 Hz), 6.86(1H, s), 7.51-7.56(2H, m), 7.59-7.62(1H, m), 7.91-7.99(6H, m), 8.68(2H, d, J=5.0 Hz)	399
B186	(CDCl <sub>3</sub> ): 3.21(1H, dd, J=10.5, 13.2 Hz), 3.31-3.41(1H, m), 3.54-3.67(1H, m), 3.61(3H, s), 3.74-3.78(1H, m), 4.01-4.10(1H, m), 4.23-4.28(1H, m), 4.92(1H, dd, J=2.1, 10.5 Hz), 6.71(1H, s), 7.50-7.54(3H, m), 7.80(2H, d, J=6.0 Hz), 7.82-7.91(4H, m), 8.71(2H, d, J=6.0 Hz)	398
B187	(DMSO-d <sub>6</sub> ): 3.18(dd, J=10.5, 12.9 Hz, 1H), 3.31-3.38(m, 1H), 3.53(s, 3H), 3.75-3.79(m, 1H), 4.00-4.18(m, 3H), 5.52-5.55(m, 1H), 7.03(s, 1H), 7.51-8.30(m, 7H), 8.42(d, J=6.0 Hz, 2H), 8.92(d, J=5.4 Hz, 2H).	399
B188	(CDCl <sub>3</sub> ): 3.09-3.33(4H, m), 3.53-3.64(2H, m), 3.57(3H, s), 3.95-4.02(1H, m), 4.13-4.20(1H, m), 4.58(2H, d, J=8.7 Hz), 4.65(1H, dd, J=2.1, 10.8 Hz), 6.70(1H, s), 6.78-6.81(1H, m), 7.13-7.16(1H, m), 7.25-7.30(1H, m), 7.80(2H, d, J=6.0 Hz), 8.71(2H, d, J=6.0 Hz)	390
B189	(DMSO-d <sub>6</sub> ): 3.07-3.27(m, 2H), 3.48(s, 3H), 3.77(d, J=13.2 Hz, 1H), 3.93-4.02(m, 2H), 4.13(d, J=10.2 Hz, 1H), 5.03(d, J=8.7 Hz, 1H), 7.13(s, 1H), 8.05(m, 1H), 8.55(d, J=6.3 Hz, 2H), 8.61(d, J=8.1 Hz, 1H), 8.90(d, J=5.4 Hz, 2H), 8.97(d, J=5.4 Hz, 2H).	388

B190	(DMSO-d <sub>6</sub> ): 3.09-3.23(m, 2H), 3.47(s, 3H), 3.68(d, J=12.6Hz, 1H), 3.87-3.94(m, 2H), 4.03(d, J=11.8Hz, 1H), 5.05(D, J=8.4Hz, 1H), 7.05(m, 1H), 7.08(s, 1H), 7.17(d, J=3.3Hz, 1H), 7.53(d, J=5.1Hz, 1H), 8.44(d, J=6.4Hz, 2H), 8.93(d, J=6.4Hz, 2H).	354
B191	(DMSO-d <sub>6</sub> ): 3.03-3.22(m, 2H), 3.45(s, 3H), 3.69-4.04(m, 4H), 4.80(d, J=10.4Hz, 1H), 7.03(s, 1H), 7.19(m, 1H), 7.52-7.55(m, 2H), 8.39(d, J=5.4Hz, 2H), 8.90(d, J=5.4Hz, 2H).	354
B194	(DMSO-d <sub>6</sub> ): 3.18(m, 1H), 3.50(s, 3H), 3.73-4.17(m, 5H), 5.03(d, J=8.4Hz, 1H), 7.15(s, 1H), 7.65(m, 1H), 7.82(d, J=7.8Hz, 1H), 8.20(t, J=7.8Hz, 1H), 8.57(d, J=6.6Hz, 2H), 8.72(d, J=4.5Hz, 1H), 8.98(d, J=6.6Hz, 2H).	349
B195	(DMSO-d <sub>6</sub> ): 3.07-3.27(m, 2H), 3.48(s, 3H), 3.77(d, J=13.2Hz, 1H), 3.93-4.02(m, 2H), 4.13(d, J=10.2Hz, 1H), 5.03(d, J=8.7Hz, 1H), 7.13(s, 1H), 8.05(m, 1H), 8.55(d, J=6.3Hz, 2H), 8.61(d, J=8.1Hz, 1H), 8.90(d, J=5.4Hz, 1H), 8.90(d, J=5.4Hz, 1H), 8.97(d, J=6.3Hz, 2H).	349
B200	(DMSO-d <sub>6</sub> ): 3.30(s, 3H), 3.36(m, 2H), 3.88(m, 2H), 4.01(m, 2H), 7.10(s, 1H), 7.22-7.42(m, 10H), 8.46(d, J=6.4Hz, 2H), 8.93(d, J=6.3Hz, 2H).	425
B202	(DMSO-d <sub>6</sub> ): 1.60-2.00(m, 3H), 2.62-2.76(m, 3H), 3.18-3.29(m, 2H), 3.48(s, 3H), 3.68-3.83(m, 3H), 4.10-4.17(m, 1H), 7.03(s, 1H), 7.10-7.24(m, 3H), 7.63-7.66(m, 1H), 8.38(d, J=6.1Hz, 2H), 8.89(d, J=6.0Hz, 2H).	388
B203	(CDCl <sub>3</sub> ): 2.20-2.40(m, 1H), 2.60-2.70(m, 1H), 2.80-3.00(m, 1H), 3.00-3.20(m, 1H), 3.29-3.50(m, 4H), 3.59(s, 3H), 4.03-3.20(m, 2H), 6.70(s, 1H), 7.27-7.36(m, 3H), 7.49-7.51(m, 1H), 7.78(dd, J=1.5, 4.8Hz, 2H), 8.70(dd, J=1.8, 4.5Hz, 2H).	374
B205	(DMSO-d <sub>6</sub> ): 1.30(s, 3H), 1.44(s, 3H), 2.80-2.95(m, 2H), 3.51(s, 3H), 3.63-3.80(m, 2H), 5.07(m, 1H), 7.03(s, 1H), 7.30-7.48(m, 5H), 8.35(br s, 2H), 8.89 (br s, 2H).	377
B217	(CDCl <sub>3</sub> ): 1.39(s, 3H), 1.52(s, 3H), 2.89-3.03(m, 2H), 3.39(m, 1H), 3.59(s, 3H), 3.63(m, 1H), 3.82(s, 3H), 5.00(m, 1H), 6.69(s, 1H), 6.93(d, J = 8.7Hz, 2H), 7.37(d, J = 8.7Hz, 2H), 7.79 (d, J = 6.0Hz, 2H), 8.71 (d, J = 6.0Hz, 2H).	407
B219	2.97(1H, dd, J=10.5, 12.9 Hz), 3.30-3.39(1H, m), 3.53-3.66(1H, m), 3.60(3H, s), 3.75-3.89(1H, m), 3.82(3H, s), 3.95-4.03(1H, m), 4.18-4.23(1H, m), 5.07(1H, d, J=9.6 Hz), 6.71(1H, s), 6.79-6.85(1H, m), 6.97-7.04(1H, m), 7.07-7.10(1H, m), 7.82(2H, d, J=6.0 Hz), 8.72(2H, d, J=6.0 Hz) (CDCl <sub>3</sub> )	396



B220	2.79(1H, dd, J=10.1, 12.7 Hz), 3.29-3.38(1H, m), 3.54-3.59(1H, m), 3.61(3H, s), 3.79-3.83(1H, m), 3.84(3H, s), 3.94-3.99(1H, m), 4.19-4.23(1H, m), 5.02(1H, dd, J=2.1, 10.1 Hz), 6.69(1H, s), 6.77(1H, d, J=8.8 Hz), 7.40(1H, dd, J=2.6, 8.7 Hz), 7.66(1H, d, J=2.3 Hz), 7.82(2H, d, J=6.1 Hz), 8.71(2H, d, J=6.1 Hz) (CDCl <sub>3</sub> )	457
B221	(DMSO-d <sub>6</sub> ): 1.40-1.60(m, 1H), 1.80-2.20(m, 2H), 2.60-3.00(m, 5H), 3.00-3.20(m, 1H), 3.45(s, 3H), 3.50-3.70(m, 2H), 3.73(d, J=11.4Hz, 1H), 3.81(d, J=12.6Hz, 1H), 3.98(d, J=12.3Hz, 1H), 7.01(s, 1H), 7.02-7.10(m, 4H), 8.38(dm, J=6.6Hz, 2H), 8.88-8.92(m, 2H).	402
B225	(CDCl <sub>3</sub> ) :3.3-3.5(2H,m),3.63(3H,s),3.5-3.7(1H,m),4.0-4.2(2H,m),4.2-4.3(1H,m),5.20(1H,dd,J=2.7,9.8Hz),6.73(1H,s),7.4-7.6(2H,m),7.80(1H,d,J=6.3Hz),7.94(1H,d,J=7.9Hz),8.03(1H,d,J=8.0Hz),8.71(1H,d,J=6.3Hz)	406
B234	(DMSO-d <sub>6</sub> ): 3.01(m, 1H), 3.17(m, 1H), 3.46(s, 3H), 3.70(m, 2H), 3.89(m, 1H), 4.05(d, J=12.0Hz, 1H), 4.65(d, J=8.7Hz, 1H), 6.02(s, 2H), 6.89-6.96(m, 2H), 7.01(s, 2H), 8.34(d, J=6.6Hz, 2H), 8.87(d, J=6.6Hz, 2H).	393
B235	(DMSO-d <sub>6</sub> ): 2.99(dd, J=10.8Hz, 12.9Hz, 1H), 3.12(m, 1H), 3.46(s, 3H), 3.69(d, J=12.9, 2H), 3.87(m, 1H), 4.04(d, J=11.7Hz, 1H), 4.24(s, 4H), 4.62(d, J=9.0Hz, 1H), 6.83-6.94(m, 3H), 7.05(s, 1H), 8.41(d, J=6.6Hz, 2H), 8.91(d, J=6.6Hz, 2H).	407
B236	(DMSO-d <sub>6</sub> ): 3.04(m, 1H), 3.19(m, 1H), 3.47(s, 3H), 3.69-4.09(m, 6H), 3.75(s, 3H), 3.77(s, 3H), 4.67(d, J=9.0Hz, 1H), 6.93-7.05(m, 4H), 8.38(d, J=6.3Hz, 2H), 8.89(d, J=6.3Hz, 2H).	409
B237	(DMSO-d <sub>6</sub> ) :2.5-2.6(1H, m), 2.9-3.2(6H, m), 3.44(3H, s), 3.4-3.8(4H, s), 3.9-4.0(1H, m), 6.99(1H, s), 7.1-7.2(2H, m), 7.2-7.3(2H, m), 7.88(1H, d, J=6.9 Hz), 8.31(2H, d, J=6.3 Hz), 8.00(1H, s), 8.88(2H, d, J=6.5 Hz)	389
B238	(DMSO) :3.05(1H, dd, J=10.8, 12.8 Hz), 3.15-3.26(1H, m), 3.45(3H, s), 3.65(1H, d, J=13.4 Hz), 3.73-3.91(2H, m), 3.79(3H, s), 4.05(1H, d, J=13.6 Hz), 4.95(1H, d, J=8.9 Hz), 6.82-6.89(3H, m), 7.43-7.49(1H, m), 7.98(2H, d, J=5.9 Hz), 8.68(2H, d, J=5.8 Hz)	397
B239	(DMSO) :2.88(1H, dd, J=10.2, 13.0 Hz), 3.19-3.27(1H, m), 3.47(3H, s), 3.66(1H, d, J=13.4 Hz), 3.85(1H, d, J=13.4 Hz), 3.93(1H, t, J=11.6 Hz), 4.11(1H, d, J=9.6 Hz), 5.03(1H, d, J=8.5 Hz), 6.84(1H, s), 7.50-7.54(1H, m), 7.63-7.67(2H, m), 7.97(2H, d, J=6.0 Hz), 8.67(2H, d, J=5.9 Hz)	417
B240	(CDCl <sub>3</sub> ): 3.00(1H, dd, J=12.9, 10.5Hz), 3.21-3.41(3H, m), 3.55(1H, m), 3.59(3H, s), 3.83-4.21(3H, m), 4.61(2H, m), 4.95(1H, d, J=8.4Hz), 6.69(1H, s), 6.91(1H, m), 7.16-7.31(2H, m), 7.84(2H, dd, J=4.5, 1.5Hz), 8.71(2H, dd, J=4.5, 1.5Hz).	391

B241	(DMSO-d <sub>6</sub> ) :2.80(1H,dd,J=10.2,12.9Hz),3.1-3.3(1H,m),3.46(3H,s),3.6-3.7(1H,m),3.77(3H,s),3.82(3H,s),3.7-3.9(2H,m),4.0-4.1(1H,m),4.9-5.0(1H,m),6.5-6.6(2H,m),6.82(1H,s),7.3-7.4(1H,m),7.79(2H,dd,J=1.5,4.5Hz),8.69(2H,dd,J=1.5,4.5Hz).	409
B242	(DMSO-d <sub>6</sub> ) :2.80(1H,dd,J=10.2,12.9Hz),3.1-3.3(1H,m),3.46(3H,s),3.6-3.7(1H,m),3.77(3H,s),3.82(3H,s),3.7-3.9(2H,m),4.0-4.1(1H,m),4.9-5.0(1H,m),6.5-6.6(2H,m),6.82(1H,s),7.3-7.4(1H,m),7.79(2H,dd,J=1.5,4.5Hz),8.69(2H,dd,J=1.5,4.5Hz).	409
B243	(DMSO-d <sub>6</sub> ) :2.7-2.9(1H,m),3.1-3.3(1H,m),3.46(3H,s),3.6-3.7(1H,m),3.89(3H,s),3.90(3H,s),3.7-3.9(2H,m),4.0-4.1(1H,m),4.9-5.0(1H,m),6.80(1H,s),6.83(1H,s),7.51(1H,s),7.9-8.0(2H,m),8.6-8.7(2H,m).	488
B244	(DMSO-d <sub>6</sub> ) :2.80(1H,dd,J=10.2,12.9Hz),3.1-3.3(1H,m),3.46(3H,s),3.6-3.7(1H,m),3.77(3H,s),3.82(3H,s),3.7-3.9(2H,m),4.0-4.1(1H,m),4.9-5.0(1H,m),6.5-6.6(2H,m),6.82(1H,s),7.3-7.4(1H,m),7.79(2H,dd,J=1.5,4.5Hz),8.69(2H,dd,J=1.5,4.5Hz).	409
B245	(CDCl <sub>3</sub> ): 2.80(1H, dd, J=12.6, 10.4Hz), 3.33(1H, m), 3.55(1H, m), 3.62(3H, s), 3.77(1H, m), 3.85(3H, s), 4.01(1H, m), 4.21(1H, m), 5.02(1H, d, J=9.6Hz), 6.61-6.75(3H, m), 7.48(1H, m), 7.82(2H, d, J=5.7Hz), 8.71(2H, d, J=5.7Hz).	397
B246	(CDCl <sub>3</sub> ):3.18(1H, dd, J=12.3, 10.1Hz), 3.35(1H, m), 3.59(1H, m), 3.60(3H, s), 3.72(1H, m), 3.98- 4.23(2H, m), 4.79(1H, d, J=10.5), 6.71(1H, s), 7.36-7.66(9H, m), 7.80(2H, d, J=5.7Hz), 8.72(2H, d, J=5.7Hz).	425
B247	(CDCl <sub>3</sub> ): 0.32-0.34(2H, m), 0.62-0.67(2H, m), 1.22(1H, m), 2.76(1H, dd, J=12.6, 10.2Hz), 3.37(1H, m), 3.60-4.25(7H, m), 3.65(3H, s), 5.02(1H, d, J=9.3Hz), 6.54-6.72(3H, m), 7.47(1H, dd, J=8.1, 7.2Hz), 7.81(2H, d, J=6.0Hz), 8.71(2H, d, J=6.0Hz).	437
B248	(CDCl <sub>3</sub> ): 1.33(3H, d, J=6.0Hz), 1.38(3H, d, J=6.0Hz), 2.72(1H, dd, J=12.6, 10.2Hz), 3.35(1H, m), 3.57-3.72(5H, m), 4.03-4.25(2H, m), 4.57(1H, m), 4.95(1H, d, J=8.7Hz), 6.58-6.71(3H, m), 7.46(1H, dd, J=8.4, 7.2Hz), 7.80(2H, d, J=6.0Hz), 8.71(2H, d, J=6.0Hz).	425
B249	(DMSO) :2.98(1H, dd, J=10.5, 13.0 Hz), 3.18-3.30(1H, m), 3.47(3H, s), 3.66(1H, d, J=12.5 Hz), 3.80(1H, d, J=13.0 Hz), 3.84(3H, s), 3.92(1H, dd, J=9.5, 11.7 Hz), 4.18(1H, d, J=11.7 Hz), 5.01(1H, dd, J=2.0, 10.4 Hz), 6.84(1H, s), 7.50(1H, d, J=2.6 Hz), 7.67(1H, d, J=2.7 Hz), 7.99(2H, d, J=6.2 Hz), 8.69(2H, d, J=6.1 Hz)	447
B250	(DMSO) :3.01(1H, dd, J=10.8, 12.9Hz), 3.14-3.18(1H, m), 3.46(3H, s), 3.66-3.76(2H, m), 3.86-3.93(1H, m), 4.06(1H, d, J=11.7 Hz), 4.74(1H, d, J=8.7 Hz), 6.84(1H, s), 6.98-7.04(4H, m), 7.11-7.18(1H, m), 7.37-7.48(4H, m), 7.97(2H, d, J=6.3 Hz), 8.69(2H, d, J=6.0 Hz)	441

B251	(CDCl <sub>3</sub> ): 3.06(1H, dd, J=12.9, 10.5Hz), 3.42(1H, m), 3.60(1H, m), 3.67(3H, s), 4.07-4.32(3H, m), 5.38(1H, d, J=10.2Hz), 6.73(1H, s), 7.45-7.61(2H, m), 7.82(1H, d, J=9.0Hz), 7.89(2H, d, J=6.0Hz), 8.72(2H, d, J=6.0Hz).	391
B252	(CDCl <sub>3</sub> ) :3.3-3.7(4H,m),3.58(3H,s),3.96(1H,t,J=11.7Hz),4.17(1H,dd,J=4.5,8.3Hz),6.70(1H,s),7.0-7.1(1H,m),7.2-7.4(2H,m),7.82(2H,d,J=5.7Hz),8.71(2H,d,J=5.6Hz)	401
B253	(CDCl <sub>3</sub> ) :2.81(1H,dd,J=10.5,12.8Hz),3.3-3.4(1H,m),3.5-3.7(2H,m),3.63(3H,s),3.7-3.9(1H,m),4.03(1H,dt,J=2.2,11.6Hz),4.2-4.3(1H,m),5.0-5.1(1H,m),6.71(1H,s),7.0-7.2(2H,m),7.63(1H,dd,J=6.3,8.7Hz),7.80(2H,d,J=6.0Hz),8.71(2H,d,J=5.6Hz).	401
B254	(DMSO) :2.89(1H, dd, J=10.2, 12.8 Hz), 3.19-3.30(1H, m), 3.49(3H, s), 3.67(1H, d, J=13.0 Hz), 3.86-3.95(2H, m), 3.89(3H, s), 4.13(1H, d, J=9.8 Hz), 5.07(1H, d, J=8.4 Hz), 6.84(1H, s), 7.15(1H, d, J=8.6 Hz), 7.29-7.37(1H, m), 7.42-7.48(2H, m), 7.60-7.63(3H, m), 7.72(1H, d, J=2.3 Hz), 8.00(2H, d, J=6.1 Hz), 8.69(2H, d, J=6.0 Hz)	455
B255	(DMSO) :2.85(1H, dd, J=10.2, 12.9 Hz), 3.19-3.28(1H, m), 3.49(3H, s), 3.67(1H, d, J=12.3 Hz), 3.85-3.95(2H, m), 3.88(3H, s), 4.13(1H, d, J=9.7 Hz), 5.06(1H, d, J=8.3 Hz), 6.84(1H, s), 7.14(1H, d, J=8.6 Hz), 7.21-7.30(2H, m), 7.57-7.70(4H, m), 8.00(2H, d, J=6.1 Hz), 8.69(2H, d, J=6.1 Hz)	473
B256	(DMSO) :2.93(1H, dd, J=10.3, 13.0 Hz), 3.19-3.31(1H, m), 3.49(3H, s), 3.68(1H, d, J=12.6 Hz), 3.86-3.95(2H, m), 3.90(3H, s), 4.13(1H, d, J=9.5 Hz), 5.08(1H, d, J=8.3 Hz), 6.84(1H, s), 7.20(1H, d, J=8.6 Hz), 7.41-7.50(1H, m), 7.66-7.70(1H, m), 7.76(1H, d, J=2.4 Hz), 8.00(2H, d, J=6.2 Hz), 8.00-8.04(1H, m), 8.50-8.54(1H, m), 8.69(2H, d, J=6.1 Hz), 8.85(1H, d, J=2.0 Hz)	456
B257	(DMSO) :2.99(1H, dd, J=10.8, 12.9 Hz), 3.10-3.21(1H, m), 3.46(3H, s), 3.66-3.77(2H, m), 3.87-3.95(1H, m), 4.08(1H, d, J=11.7 Hz), 4.76(1H, d, J=8.4 Hz), 6.85(1H, s), 7.28-7.33(1H, m), 7.41-7.56(2H, m), 7.96(2H, d, J=6.0 Hz), 8.69(2H, d, J=6.0 Hz)	385
B258	(DMSO) :2.99(1H, dd, J=10.7, 12.6 Hz), 3.13-3.22(1H, m), 3.46(3H, s), 3.67-3.77(2H, m), 3.87-3.95(1H, m), 4.08(1H, d, J=11.5 Hz), 4.76(1H, d, J=9.2 Hz), 6.86(1H, s), 7.41(1H, t, J=8.6 Hz), 7.48-7.54(1H, m), 7.72-7.81(1H, m), 7.98(2H, d, J=5.9 Hz), 8.69(2H, d, J=5.9 Hz)	445
B259	(DMSO-d <sub>6</sub> ) :1.23(6H,d,J=5.9Hz),2.7-2.9(1H,m),3.1-3.3(1H,m),3.47(3H,s),3.6-3.7(1H,m),3.7-4.0(2H,m),3.78(3H,s),4.0-4.1(1H,m),4.4-4.6(1H,m),4.9-5.0(1H,m),6.8-7.0(4H,m),8.00(2H,d,J=5.3Hz),8.69(2H,d,J=5.6Hz)	437

B260	(DMSO-d <sub>6</sub> ) :2.17(3H,s),2.22(3H,s),2.7-2.8(1H,m),3.1-3.2(1H,m),3.46(3H,s),3.6-3.7(1H,m),3.7-3.9(2H,m),3.79(3H,s),4.0-4.1(1H,m),6.84(2H,s),7.19(1H,s),7.99(2H,d,J=5.0Hz),8.69(2H,d,J=4.7Hz)	407
B261	(DMSO-d <sub>6</sub> ) :1.27(6H,d,J=5.1Hz),2.7-2.9(1H,m),3.1-3.3(1H,m),3.46(3H,s),3.6-4.0(3H,m),3.84(3H,s),4.0-4.1(1H,m),4.6-4.7(1H,m),4.9-5.0(1H,m),6.5-6.6(2H,m),6.84(1H,s),7.2-7.3(1H,m),7.99(2H,d,J=6.0Hz),8.69(2H,d,J=6.0Hz)	437
B262	(DMSO-d <sub>6</sub> ) :2.7-2.9(1H,m),3.2-3.3(1H,m),3.47(3H,s),3.6-3.7(1H,m),3.8-4.0(5H,m),4.1-4.2(1H,m),5.0-5.1(1H,m),6.86(1H,s),7.26(1H,d,J=8.5Hz),7.78(1H,s),7.84(1H,d,J=8.5Hz),8.00(2H,d,J=5.7Hz),8.70(2H,d,J=5.6Hz)	404
B263	(CDCl <sub>3</sub> ): 1.40(3H, t, J=6.9Hz), 3.38-3.47(3H, m), 3.86(6H, s), 3.91-4.17(5H, m), 5.44(1H, dd, J=10.8, 2.1Hz), 6.60(1H, d, J=8.4Hz), 6.67(1H, s), 7.24-7.30(2H, m), 7.84(2H, d, J=6.0Hz), 8.70(2H, d, J=6.0Hz).	423
B264	(CDCl <sub>3</sub> ): 0.95(3H, t, J=7.2Hz), 1.77-1.86(2H, m), 3.34-3.47(2H, m), 3.89(6H, s), 3.92-4.48(5H, m), 5.44(1H, d, J=8.4Hz), 6.60(1H, d, J=8.4Hz), 6.67(1H, s), 7.24-7.30(2H, m), 7.84(2H, d, J=6.0Hz), 8.70(2H, d, J=6.0Hz).	437
B265	(DMSO-d <sub>6</sub> ): 1.30(3H, t, J=6.6Hz), 2.97-4.10(8H, m), 4.78(1H, d, J=9.6Hz), 7.08(1H, s), 7.19-7.25(2H, m), 7.48-7.54(2H, m), 8.35(2H, d, J=6.0Hz), 8.88(2H, d, J=6.0Hz).	381
B266	(DMSO-d <sub>6</sub> ): 0.88(3H, t, J=7.2Hz), 1.69-1.77(2H, m), 1.26(1H, m), 3.00-3.26(2H, m), 3.59(2H, m), 3.88-4.12(3H, m), 4.78(1H, d, J=9.6Hz), 7.08(1H, s), 7.20-7.26(2H, m), 7.49-7.54(2H, m), 8.36(2H, d, J=6.0Hz), 8.90(2H, d, J=6.0Hz).	395
B267	(CDCl <sub>3</sub> ): 0.39-0.43(2H, m), 0.53-0.58(2H, m), 1.26(1H, m), 3.09(1H, dd, J=12.6, 10.8Hz), 3.29-3.51(3H, m), 3.92(1H, m), 3.61(3H, s), 3.77(1H, m), 3.85(3H, s), 3.99(1H, m), 4.21(1H, m), 5.01(1H, dd, J=9.9, 1.8Hz), 6.63(1H, dd, J=10.8, 2.4Hz), 6.69(1H, s), 6.72(1H, m), 7.48(1H, dd, J=8.4, 6.9Hz), 7.82(2H, dd, J=4.8, 1.8Hz), 8.71(2H, dd, J=4.8, 1.8Hz).	407
B268	(CDCl <sub>3</sub> ) :3.3-3.4(1H,m),3.5-3.6(2H,m),3.59(3H,s),3.83(3H,s),3.9-4.1(2H,m),4.1-4.2(1H,m),4.96(1H,dd,J=2.4,10.2Hz),6.50(1H,s),6.73(1H,s),6.9-7.1(1H,m),7.2-7.3(2H,m),7.81(2H,dd,J=1.5,4.5Hz),8.74(2H,dd,J=1.2,4.5Hz)	420
B269	(DMSO-d <sub>6</sub> ) :2.78(1H,dd,J=10.2,12.8Hz),3.1-3.3(1H,m),3.47(3H,s),3.6-3.7(1H,m),3.8-4.0(5H,m),4.0-4.1(1H,m),4.9-5.0(1H,m),6.84(1H,s),7.06(1H,dd,J=2.0,8.2Hz),7.13(1H,d,J=2.0Hz),7.44(1H,d,J=8.2Hz),7.99(2H,dd,J=1.6,4.7Hz),8.69(2H,dd,J=1.6,4.7Hz)	413
B270	(DMSO-d <sub>6</sub> ) :3.1-3.3(1H,m),3.42(3H,s),3.5-3.6(1H,m),3.6-3.7(2H,m),3.7-3.9(1H,m),3.86(3H,s),3.9-4.0(1H,m),5.1-5.2(1H,m),6.8-7.0(3H,m),7.9-8.0(2H,m),8.6-8.7(2H,m)	415

B271	(CDCl <sub>3</sub> ) :3.3-3.5(1H,m),3.5-3.7(2H,m),3.61(3H,s),3.9-4.3(3H,m),5.35(1H,dd,J=2.8,9.8Hz),6.73(1H,s),7.3-7.4(1H,m),7.6-7.7(2H,m),7.80(2H,dd,J=1.5,4.7Hz),7.96(1H,d,J=8.1Hz),8.71(2H,dd,J=1.5,4.7Hz)	390
B272	(DMSO-d <sub>6</sub> ) :2.7-2.8(1H,m),3.2-3.3(1H,m),3.47(3H,s),3.6-3.7(1H,m),3.8-4.0(5H,m),4.1-4.2(1H,m),5.0-5.1(1H,m),6.84(1H,s),7.48(1H,d,J=8.1Hz),7.54(1H,s),7.62(1H,d,J=8.1Hz),7.99(2H,dd,J=1.2,4.5Hz),8.70(2H,d,J=1.2,4.5Hz)	404
B273	(DMSO-d <sub>6</sub> ) :2.8-2.9(1H,m),3.1-3.3(1H,m),3.49(3H,s),3.6-3.8(1H,m),3.8-4.0(5H,m),4.1-4.2(1H,m),5.0-5.1(1H,m),6.86(1H,s),7.2-7.6(5H,m),7.72(2H,d,J=7.5Hz),8.01(2H,d,J=6.3Hz),8.70(2H,d,J=6.0Hz)	455
B274	(CDCl <sub>3</sub> ) :1.9-2.1(4H,m),2.83(1H,dd,J=10.2,12.6Hz),3.2-3.5(5H,m),3.5-3.7(1H,m),3.62(3H,s),3.79(3H,s),3.8-3.9(1H,m),3.9-4.1(1H,m),4.2-4.3(1H,m),5.0-5.1(1H,m),6.49(1H,dd,J=3.0,9.0Hz),6.68(1H,s),6.8-6.9(2H,m),7.82(2H,d,J=6.0Hz),8.71(2H,d,J=6.0Hz)	448
B275	(CDCl <sub>3</sub> ) :1.9-2.1(4H,m),2.89(1H,dd,J=10.3,12.8Hz),3.2-3.4(5H,m),3.5-3.6(1H,m),3.60(3H,s),3.75(3H,s),3.7-3.8(1H,m),3.9-4.1(1H,m),4.1-4.3(1H,m),4.99(1H,dd,J=2.1,10.2Hz),6.08(1H,d,J=2.1Hz),6.21(1H,dd,J=2.0,8.5Hz),6.68(1H,s),7.31(1H,d,J=8.5Hz),7.82(2H,dd,J=1.6,4.6Hz),8.71(2H,dd,J=1.6,4.6Hz)	448
B276	(DMSO) :2.84(1H, dd, J=10.5, 12.8 Hz), 3.19-3.26(1H, m), 3.49(3H, s), 3.66(1H, d, J=12.7 Hz), 3.88-3.94(2H, m), 3.90(3H, s), 4.12(1H, d, J=10.3 Hz), 5.06(1H, d, J=9.2 Hz), 6.85(1H, s), 7.17(1H, d, J=8.6 Hz), 7.26-7.33(2H, m), 7.36-7.40(1H, m), 7.48-7.53(2H, m), 7.63(1H, s), 8.01(2H, d, J=5.7 Hz), 8.69(2H, d, J=5.6 Hz)	473
B277	(DMSO) :2.90(1H, dd, J=10.3, 12.8 Hz), 3.26-3.29(1H, m), 3.49(3H, s), 3.67(1H, d, J=13.1 Hz), 3.82(3H, s), 3.85-3.94(2H, m), 3.89(3H, s), 4.14(1H, d, J=9.6 Hz), 5.06(1H, d, J=8.7 Hz), 6.85(1H, s), 6.90-6.93(1H, m), 7.12-7.19(3H, m), 7.34-7.39(1H, m), 7.60-7.64(1H, m), 7.71(1H, d, J=2.1 Hz), 8.01(2H, d, J=6.0 Hz), 8.69(2H, d, J=5.9 Hz)	485
B278	(DMSO) :2.84(1H, dd, J=10.5, 12.6 Hz), 3.18-3.25(1H, m), 3.48(3H, s), 3.66(1H, d, J=13.2 Hz), 3.86-3.93(2H, m), 3.90(3H, s), 4.10(1H, d, J=10.2 Hz), 5.07(1H, d, J=9.0 Hz), 6.85(1H, s), 7.16(1H, d, J=8.7 Hz), 7.39-7.45(2H, m), 7.50-7.52(2H, m), 7.72(1H, d, J=1.8 Hz), 8.01(2H, d, J=5.4 Hz), 8.70(2H, d, J=5.4 Hz)	523
B279	(DMSO) :1.52-1.71(4H, m), 2.32-2.43(4H, m), 2.76(1H, dd, J=10.2, 12.9 Hz), 3.18-3.25(1H, m), 3.47(3H, s), 3.54(2H, d, J=3.9 Hz), 3.65(1H, d, J=12.9 Hz), 3.81-3.91(2H, m), 3.82(3H, s), 4.10(1H, d, J=9.9 Hz), 4.99(1H, d, J=8.7 Hz), 6.84(1H, s), 6.97(1H, d, J=8.4 Hz), 7.17-7.23(1H, m), 7.39(1H, d, J=1.8 Hz), 8.00(2H, d, J=6.0 Hz), 8.69(2H, d, J=6.0 Hz)	462

B280	(DMSO) :3.11(1H, dd, J=10.3, 12.6 Hz), 3.41-3.48(1H, m), 3.67(3H, s), 3.86(1H, d, J=12.7 Hz), 4.03-4.13(2H, m), 4.08(3H, s), 4.32(1H, d, J=11.0 Hz), 5.25(1H, d, J=8.6 Hz), 7.04(1H, s), 7.33-7.36(2H, m), 7.60-7.70(3H, m), 7.86(1H, dd, J=2.4, 8.5 Hz), 7.93(1H, d, J=2.3 Hz), 8.19(2H, d, J=6.1 Hz), 8.88(2H, d, J=6.0 Hz)	473
B281	(DMSO) :2.83(1H, dd, J=10.2, 12.9 Hz), 3.14-3.25(1H, m), 3.49(3H, s), 3.66(1H, d, J=12.6 Hz), 3.76(3H, s), 3.84-3.93(2H, m), 3.87(3H, s), 4.10(1H, d, J=11.4 Hz), 5.04(1H, d, J=8.7 Hz), 6.85(1H, s), 6.98-7.03(1H, m), 7.07-7.11(2H, m), 7.25-7.34(2H, m), 7.41-7.47(1H, m), 7.53(1H, d, J=2.4 Hz), 8.01(2H, d, J=6.3 Hz), 8.70 (2H, d, J=6.0 Hz)	485
B282	(DMSO) :2.88(1H, dd, J=10.3, 12.9 Hz), 3.18-3.28(1H, m), 3.48(3H, s), 3.67(1H, d, J=12.8 Hz), 3.79(3H, s), 3.85-3.94(2H, m), 3.87(3H, s), 4.13(1H, d, J=11.6 Hz), 5.05(1H, d, J=8.4 Hz), 6.85(1H, s), 7.01(1H, d, J=8.8 Hz), 7.11(1H, d, J=8.7 Hz), 7.53-7.56(3H, m), 7.66(1H, d, J=2.3 Hz), 8.00(2H, d, J=6.1 Hz), 8.69(2H, d, J=6.0 Hz)	485
B283	(DMSO) :2.77(1H, dd, J=10.2, 12.8 Hz), 3.10-3.21(1H, m), 3.47(3H, s), 3.65(1H, d, J=12.9 Hz), 3.80(3H, s), 3.84-3.92(2H, m), 4.04-4.10(1H, m), 4.98(1H, d, J=8.4 Hz), 6.68-6.73(1H, m), 6.85(1H, s), 6.92-6.98(3H, m), 7.01-7.08(1H, m), 7.14-7.20(2H, m), 7.23(1H, d, J=2.6 Hz), 7.94(1H, s), 8.01(2H, d, J=6.1 Hz), 8.69(2H, d, J=6.1 Hz)	470
B284	(CDCl <sub>3</sub> ) :3.37-3.54(3H, m), 3.59(3H, s), 3.88(1H, m), 4.03(1H, m), 4.18(1H, m), 4.99(1H, dd, J=10.2, 2.4Hz), 6.73(1H, s), 6.78(1H, s), 7.25-7.33(2H, m), 7.49-7.58(2H, m), 7.81(2H, dd, J=4.5, 1.8Hz), 8.72(dd, J=4.5, 1.8Hz).	389
B285	(CDCl <sub>3</sub> ) :2.80(1H, dd, J=12.9, 10.2Hz), 3.35(1H, m), 3.55(1H, m), 3.61(3H, s), 3.77(1H, m), 3.85(3H, s), 3.99(1H, m), 4.21(1H, m), 5.01(1H, dd, J=9.9, 1.8Hz), 6.63(1H, dd, J=10.8, 2.4Hz), 6.69(1H, s), 6.72(1H, m), 7.48(1H, dd, J=8.4, 6.9Hz), 7.82(2H, dd, J=4.8, 1.8Hz), 8.71(2H, dd, J=4.8, 1.8Hz).	397
B286	(CDCl <sub>3</sub> ) :3.33-3.53(3H, m), 3.58(3H, s), 3.88(1H, m), 3.98(1H, m), 4.01(3H, s), 4.18(1H, m), 5.00(1H, m), 6.72(1H, s), 6.77(1H, s), 6.82(1H, m), 7.16-7.19(2H, m), 7.83(2H, d, J=6.0Hz), 8.72(2H, d, J=6.0Hz).	419
B287	(DMSO-d <sub>6</sub> ) :1.9-2.1(4H,m),2.9-3.2(3H,m),3.2-3.5(3H,m),3.51(3H,s),3.72(1H,d,J=11.7Hz),3.90(3H,s),3.8-4.1(2H,m),4.14(1H,d,J=12.9Hz),4.41(2H,d,J=5.4Hz),5.08(1H,d,J=9.6Hz),7.08(1H,s),7.18(1H,d,J=8.7Hz),7.4-7.6(1H,m),7.6-7.8(2H,m),7.79(1H,s),7.96(1H,s),8.46(2H,d,J=6.0Hz),8.93(2H,d,J=5.4Hz),11.5(1H,brd)	538

B288	(CDCl <sub>3</sub> ) :1.9-2.1(4H,m),3.17(1H,dd,J=10.5,12.9Hz),3.3-3.4(5H,m),3.5-3.6(1H,m),3.57(3H,s),3.7-3.8(1H,m),3.9-4.1(1H,m),4.1-4.2(1H,m),4.69(1H,dd,J=2.1,10.5Hz),6.73(1H,s),6.54(1H,m),6.60(1H,d,J=1.2Hz),6.6-6.7(2H,m),7.2-7.3(1H,m)7.81(2H,dd,J=1.5,4.5Hz),8.71(2H,dd,J=1.8,4.5Hz)	418
B289	(CDCl <sub>3</sub> ) :1.9-2.1(4H,m),3.17(1H,dd,J=10.5,12.9Hz),3.3-3.4(5H,m),3.5-3.6(1H,m),3.57(3H,s),3.7-3.8(1H,m),3.9-4.1(1H,m),4.1-4.2(1H,m),4.69(1H,dd,J=2.1,10.5Hz),6.73(1H,s),6.54(1H,m),6.60(1H,d,J=1.2Hz),6.6-6.7(2H,m),7.2-7.3(1H,m)7.81(2H,dd,J=1.5,4.5Hz),8.71(2H,dd,J=1.8,4.5Hz)	418
B290	(CDCl <sub>3</sub> ): 2.87(1H, m), 3.38(1H, m), 3.58(1H, m), 3.64(3H, s), 3.84(1H, m), 3.91(3H, s), 4.03(1H, m), 4.22(1H, m), 5.11(1H, m), 6.70(1H, s), 7.08-7.46(6H, m), 7.60(1H, d, J=5.1Hz), 7.83(2H, d, J=6.0Hz), 8.72(2H, d, J=6.0Hz).	473
B291	(CDCl <sub>3</sub> ): 2.86(1H, dd, J=12.9, 10.2Hz), 3.38(1H, m), 3.57(1H, m), 3.64(3H, s), 3.88(1H, m), 3.93(3H, s), 4.02(1H, m), 4.26(1H, m), 5.10(1H, m), 6.70(1H, s), 7.05-7.07(2H, m), 7.21-7.42(4H, m), 7.60(1H, d, J=4.8Hz), 7.83(2H, dd, J=4.5, 1.2Hz), 8.72(2H, dd, J=4.5, 1.2Hz).	473
B292	(CDCl <sub>3</sub> ): 2.86(1H, dd, J=12.9, 10.2Hz), 3.35(1H, m), 3.57(1H, m), 3.64(3H, s), 3.88(1H, m), 3.93(3H, s), 4.02(1H, m), 4.22(1H, m), 5.10(1H, m), 6.70(1H, s), 7.04(1H, s), 7.10-7.23(3H, m), 7.52-7.60(3H, m), 7.83(2H, d, J=6.0Hz), 8.72(2H, d, J=6.0Hz).	473
B293	(DMSO) :2.86(1H, dd, J=10.2, 12.8 Hz), 3.22-3.30(1H, m), 3.49(3H, S), 3.68(1H, d, J=12.1 Hz), 3.87-3.96(2H, m), 3.91(3H,s), 4.16(1H, d, J=11.9 Hz), 5.07(1H, d, J=8.7 Hz), 6.85(1H, s), 7.16(1H, d, J=8.7 Hz), 7.27-7.32(1H, m), 7.81-7.94(2H, m), 7.99-8.05(3H, m), 8.26(1H, d, J=2.3 Hz), 8.63-8.65(1H, m), 8.69(2H, d, J=6.0 Hz)	456
B294	(DMSO) :2.90(1H, dd, J=10.5, 12.9 Hz), 3.20-3.29(1H, m), 3.49(3H,s), 3.68(1H, d, J=12.3 Hz), 3.84-3.92(2H, m), 3.91(3H,s), 3.95(3H, s), 4.15(1H, d, J=12.0 Hz), 5.07(1H, d, J=9.0 Hz), 6.73(1H, d, J=8.1 Hz), 6.85(1H, s), 7.17(1H, d, J=8.7 Hz), 7.48(1H, d, J=7.5 Hz), 7.76(1H, t, J=7.8 Hz), 8.01(2H, d, J=6.0 Hz), 8.07(1H, dd, J=2.1, 8.7 Hz), 8.15(1H, d, J=2.1 Hz), 8.69(1H, d, J=6.0 Hz)	486
B295	(DMSO) :2.91(1H, dd, J=10.2, 12.8 Hz), 3.21-3.28(1H, m), 3.48(3H, s), 3.67(1H, d, J=12.5 Hz), 3.84-3.94(2H, m), 3.88(3H, s), 3.89(3H, s), 4.12(1H, d, J=9.9 Hz), 5.06(1H, d, J=8.5 Hz), 6.85(1H, s), 6.90(1H, d, J=8.7 Hz), 7.15(1H, d, J=8.6 Hz), 7.58-7.63(1H, m), 7.67(1H, d, J=2.4 Hz), 7.94-7.98(1H, m), 8.01(2H, d, J=6.1 Hz), 8.42(1H, d, J=2.3 Hz), 8.69(2H, d, J=6.2 Hz)	486

B296	(DMSO) :2.84(1H, dd, J=10.5, 12.6 Hz), 3.18-3.25(1H, m), 3.48(3H, s), 3.62(1H, d, J=13.2 Hz), 3.85-3.99(2H, m), 3.87(3H, s), 3.94(6H, s), 4.11(1H, d, J=10.2 Hz), 5.04(1H, d, J=9.6 Hz), 6.85(1H, s), 7.12(1H, d, J=8.7 Hz), 7.46(1H, d, J=8.4 Hz), 7.56(1H, s), 8.00(2H, d, J=4.8 Hz), 8.32(1H, s), 8.70(2H, d, J=5.1 Hz)	487
B297	(CDCl <sub>3</sub> ) :2.2-2.4(1H, m), 2.4-2.6(1H, m), 3.3-3.4(1H, m), 3.5-3.8(3H, m), 3.58(3H, s), 3.9-4.1(1H, m), 4.1-4.3(2H, m), 4.5-4.6(1H, m), 6.71(1H, s), 6.87(1H, d, J=8.4 Hz), 7.00(1H, t, J=7.8 Hz), 7.25(1H, t, J=8.4 Hz), 7.62(1H, dd, J=1.5, 8.1 Hz), 7.78(2H, dd, J=1.5, 4.5 Hz), 8.71(2H, dd, J=1.8, 6.6 Hz)	391
B298	(CDCl <sub>3</sub> ) :1.8-2.0(3H, m), 2.3-2.4(1H, m), 3.2-3.4(1H, m), 3.44(3H, s), 3.5-3.6(1H, m), 3.7-3.9(3H, m), 4.1-4.2(1H, m), 4.2-4.4(2H, m), 6.66(1H, s), 7.02(1H, dd, J=1.2, 8.1 Hz), 7.14(1H, t, J=7.2 Hz), 7.22(1H, dd, J=1.8, 7.5 Hz), 7.59(1H, dd, J=1.8, 7.8 Hz), 7.79(2H, dd, J=1.5, 4.5 Hz), 8.71(2H, dd, J=1.5, 4.5 Hz)	405
C001	(CDCl <sub>3</sub> ) :1.79-1.95(m, 3H), 2.14(m, 1H), 3.08(m, 1H), 3.26(dd, J=12.6, 7.2 Hz, 1H), 3.53(s, 3H), 3.65(m, 1H), 3.82-3.96(m, 2H), 6.65(s, 1H), 7.47(t, J=7.8 Hz, 2H), 7.61(t, J=7.5 Hz, 1H), 7.79(d, J=6.0 Hz, 2H), 8.02(d, J=7.5 Hz, 2H), 8.70(d, J=6.0 Hz, 2H).	374
C002	(CDCl <sub>3</sub> ) :1.81-1.92(m, 3H), 2.12(m, 1H), 3.08(m, 1H), 3.25(m, 1H), 3.52(s, 3H), 3.64(m, 1H), 3.75-3.92(m, 2H), 6.65(s, 1H), 7.12(t, J=8.4 Hz, 2H), 7.84(m, 1H), 8.03(dd, J=7.8, 5.7 Hz, 2H), 8.76(m, 1H).	392
C005	(CDCl <sub>3</sub> ) :1.65-1.93(m, 3H), 2.13(m, 1H), 3.08(m, 1H), 3.25(dd, J=12.9, 10.5 Hz, 1H), 3.53(s, 3H), 3.65(m, 1H), 3.88(s, 3H), 3.77-3.94(m, 2H), 6.65(s, 1H), 6.93(dd, J=9.6, 1.2 Hz, 2H), 7.80(d, J=6.0 Hz, 2H), 8.00(dd, J=9.9, 1.2 Hz, 2H), 8.70(d, J=6.0 Hz, 2H).	405
C006	(CDCl <sub>3</sub> ) :1.69-1.92(m, 3H), 2.12(m, 1H), 3.06(m, 1H), 3.21(dd, J=12.9, 10.2 Hz, 1H), 3.50(s, 3H), 3.60-3.83(m, 3H), 3.86(s, 3H), 6.66(s, 1H), 6.96-7.05(m, 2H), 7.45-7.57(m, 2H), 7.79(d, J=4.5 Hz, 2H), 8.69(d, J=4.8 Hz, 2H).	405
C067	(CDCl <sub>3</sub> ) :1.83-2.14(m, 4H), 2.77(m, 1H), 3.06(m, 1H), 3.37(m, 1H), 3.45(s, 3H), 3.58(m, 1H), 3.90(m, 1H), 6.64(s, 1H), 7.13(m, 1H), 7.33(m, 2H), 7.53(d, J=8.2 Hz, 2H), 7.64(m, 1H), 7.79(d, J=5.8 Hz, 2H), 8.70(d, J=5.7 Hz, 2H).	390
C091	(CDCl <sub>3</sub> ) :1.81-2.01(6H, m), 2.70-2.75(2H, m), 3.00(1H, m), 3.25-3.92(6H, m), 3.35(3H, s), 6.61(1H, s), 7.12-7.26(4H, m), 7.72(2H, d, J=6.0 Hz), 8.69(2H, d, J=6.0 Hz).	430
C092	(DMSO-d <sub>6</sub> ) :1.48-1.89(m, 10H), 2.92-3.07(m, 4H), 3.41(s, 3H), 3.42-3.72(m, 5H), 6.97(s, 1H), 8.38(d, J=5.1 Hz, 2H), 8.92(d, J=5.1 Hz, 2H).	382



C094	(CDCl <sub>3</sub> ): 1.74-2.05(m, 4H), 3.08(m, 2H), 3.28(m, 1H), 3.51(s, 3H), 3.59-3.80(m, 10H), 6.63(s, 1H), 7.76(d, J=4.8Hz, 2H), 8.71(d, J=4.8Hz, 2H).	384
C101	(CDCl <sub>3</sub> ): 3.37-3.50(m, 3H), 3.57(s, 3H), 3.90-4.00(m, 2H), 4.10-4.19(m, 1H), 5.14(dd, J=2.7, 9.3Hz, 1H), 6.70(s, 1H), 7.48(t, J=7.8Hz, 2H), 7.63(t, J=7.5Hz, 1H), 7.79(dd, J=1.5, 4.8Hz, 2H), 8.06(dd, J=1.2, 7.2Hz, 2H), 8.73(dd, J=1.8, 6.3Hz, 2H).	377
C102	(CDCl <sub>3</sub> ): 3.30-3.50(m, 3H), 3.58(s, 3H), 3.85-4.17(m, 3H), 5.04(dd, J=2.7, 9.3Hz, 1H), 6.07(s, 1H), 7.14(dd, J=7.2, 8.7Hz, 2H), 7.78(dd, J=1.5, 4.8Hz, 2H), 8.11(m, 2H), 8.73(dd, J=1.5, 4.5Hz, 2H).	395
C105	(CDCl <sub>3</sub> ): 1.65-1.93(3H, m), 2.13(1H, m), 3.08(1H, m), 3.25(1H, dd, J=12.9, 10.5Hz), 3.53(3H, s), 3.65(1H, m), 3.88(3H, s), 3.77-3.94(2H, m), 6.65(1H, s), 6.93(2H, dd, J=9.6, 1.2Hz), 7.80(2H, d, J=6.0Hz), 8.00(2H, dd, J=9.9, 1.2Hz), 8.70(2H, d, J=6.0Hz).	405
C106	(CDCl <sub>3</sub> ): 1.69-1.92(3H, m), 2.12(1H, m), 3.06(1H, m), 3.21(1H, dd, J=12.9, 10.2Hz), 3.50(3H, s), 3.60-3.83(3H, m), 3.86(3H, s), 6.66(1H, s), 6.96-7.05(2H, m), 7.45-7.57(2H, m), 7.79(2H, d, J=4.5Hz), 8.69(2H, d, J=4.8Hz).	405
C386	(CDCl <sub>3</sub> ): 1.80-2.11(4H, m), 3.07(1H, m), 3.26(1H, dd, J=13.1, 10.7Hz), 3.53(3H, s), 3.59-3.66(2H, m), 3.88(1H, m), 6.65(1H, s), 6.95(1H, d, J=4.2Hz), 7.62(1H, d, J=4.2Hz), 7.78(2H, dd, J=4.5, 1.6Hz), 8.71(2H, dd, J=4.5, 1.6Hz).	415
C389	(CDCl <sub>3</sub> ): 3.3-3.7(3H, m), 3.57(3H, s), 3.9-4.0(2H, m), 4.1-4.2(1H, m), 5.14(1H, dd, J=2.1, 9.0Hz), 6.70(1H, s), 7.4-7.5(2H, m), 7.6-7.7(1H, m), 7.78(2H, dd, J=1.2, 4.5Hz), 8.05(2H, dd, J=1.2, 7.2Hz), 8.73(2H, dd, J=0.9, 4.5Hz)	377
C390	(CDCl <sub>3</sub> ): 3.3-3.7(3H, m), 3.57(3H, s), 3.9-4.0(2H, m), 4.1-4.2(1H, m), 5.14(1H, dd, J=2.1, 9.0Hz), 6.70(1H, s), 7.4-7.5(2H, m), 7.6-7.7(1H, m), 7.78(2H, dd, J=1.2, 4.5Hz), 8.05(2H, dd, J=1.2, 7.2Hz), 8.73(2H, dd, J=0.9, 4.5Hz)	377
D001	(CDCl <sub>3</sub> ): 2.01-2.10(m, 4H), 3.16(m, 2H), 3.56(s+m, 3H+1H), 3.76(m, 2H), 6.69(s, 1H), 7.53(m, 2H), 7.63(m, 1H), 7.83(d, J=6.0Hz, 2H), 8.50(d, J=7.2Hz, 2H), 8.73(d, J=6.0Hz, 2H).	375
D002	(CDCl <sub>3</sub> ): 1.93(m, 2H), 2.12(m, 2H), 3.12(m, 2H), 3.42(m, 1H), 3.53(s, 3H), 3.71(m, 2H), 6.68(s, 1H), 7.17(m, 1H), 7.28(m, 1H), 7.56(m, 1H), 7.80-7.86(m, 3H), 8.71(d, J=6.0Hz, 2H).	393
D003	(CDCl <sub>3</sub> ): 1.94-2.10(m, 4H), 3.15(m, 2H), 3.49(m, 1H), 3.55(s, 3H), 3.75(m, 2H), 6.69(s, 1H), 7.31(m, 1H), 7.50(m, 1H), 7.65(m, 1H), 7.76(d, J=7.8Hz, 1H), 7.82(d, J=6.0Hz, 2H), 8.72(d, J=6.0Hz, 2H).	393

D004	(CDCl <sub>3</sub> ): 1.95-2.06(m, 4H), 3.14(m, 2H), 3.50(m, 1H), 3.55(s, 3H), 3.75(m, 2H), 6.69(s, 1H), 7.19(t, J=8.6Hz, 2H), 7.82(d, J=6.0Hz, 2H), 8.02(m, 2H), 8.71(d, J=6.0Hz, 2H).	393
D005	(CDCl <sub>3</sub> ): 1.89(m, 2H), 2.08(m, 2H), 3.06(m, 2H), 3.50(m, 1H), 3.53(s, 3H), 3.67(m, 2H), 3.93(s, 3H), 6.66(s, 1H), 6.98-7.06(m, 2H), 7.49(m, 1H), 7.61(m, 1H), 7.81(d, J=6.0Hz, 2H), 8.71(d, J=6.0Hz, 2H).	405
D006	(CDCl <sub>3</sub> ): 1.94-2.10(m, 4H), 3.14(m, 2H), 3.50(m, 1H), 3.54(s, 3H), 3.74(m, 2H), 3.88(s, 3H), 6.68(s, 1H), 7.15(m, 1H), 7.39-7.57(m, 3H), 7.82(d, J=6.3Hz, 2H), 8.71(d, J=6.3Hz, 2H).	405
D007	(CDCl <sub>3</sub> ): 1.99-2.06(m, 4H), 3.13(m, 2H), 3.50(m, 1H), 3.55(s, 3H), 3.75(m, 2H), 3.90(s, 3H), 6.68(s, 1H), 6.99(d, J=9.0Hz, 2H), 7.82(d, J=6.0Hz, 2H), 7.98(d, J=9.0Hz, 2H), 8.71(d, J=6.0Hz, 2H).	405
D008	(CDCl <sub>3</sub> ): 1.94-2.06(m, 4H), 3.15(m, 2H), 3.49(m, 1H), 3.54(s, 3H), 3.75(m, 2H), 6.69(s, 1H), 7.44-7.60(m, 2H), 7.81-7.93(m, 3H), 7.94(s, 1H), 8.71(d, J=5.7Hz, 2H).	409
D009	(CDCl <sub>3</sub> ): 1.94-2.06(m, 4H), 3.13(m, 2H), 3.49(m, 1H), 3.54(s, 3H), 3.74(m, 2H), 6.69(s, 1H), 7.49(d, J=8.4Hz, 2H), 7.81(d, J=6.0Hz, 2H), 7.92(d, J=8.4Hz, 2H), 8.71(d, J=6.0Hz, 2H).	409
D0010	(CDCl <sub>3</sub> ): 1.95-2.06(m, 4H), 3.13(m, 2H), 3.48(m, 1H), 3.54(s, 3H), 3.74(m, 2H), 6.68(s, 1H), 7.66(d, J=8.4Hz, 2H), 7.80-7.86(m, 4H), 8.71(d, J=6.0Hz, 2H).	454
D011	(CDCl <sub>3</sub> ): 1.89(m, 2H), 2.08(m, 2H), 3.06(m, 2H), 3.38(m, 1H), 3.52(s, 3H), 3.67(m, 2H), 3.91(s, 3H), 3.92(s, 3H), 6.66(s, 1H), 7.02-7.16(m, 3H), 7.80(d, J=6.0Hz, 2H), 8.71(d, J=6.0Hz, 2H).	435
D012	(CDCl <sub>3</sub> ): 1.93(m, 2H), 2.10(m, 2H), 3.11(m, 2H), 3.38(m, 1H), 3.53(s, 3H), 3.72(m, 2H), 6.68(s, 1H), 6.88-7.04(m, 2H), 7.81(d, J=5Hz, 2H), 7.91(m, 1H), 8.71(d, J=5Hz, 2H).	411
D013	(CDCl <sub>3</sub> ): 1.95-2.06(m, 4H), 3.14(m, 2H), 3.46(m, 1H), 3.54(s, 3H), 3.75(m, 2H), 6.69(s, 1H), 7.32(m, 1H), 7.75-7.86(m, 4H), 8.71(d, J=5.9Hz, 2H).	411
D014	(CDCl <sub>3</sub> ): 2.06-2.08(m, 4H), 3.12(m, 2H), 3.38(m, 1H), 3.55(s, 3H), 3.76(m, 2H), 6.69(s, 1H), 7.19(m, 1H), 7.71(d, J=5.2Hz, 2H), 7.79-7.83(m, 3H), 8.71(d, J=5.6Hz, 2H).	381
D015	(CDCl <sub>3</sub> ): 1.95-2.07(m, 4H), 3.11(m, 2H), 3.37(m, 1H), 3.55(s, 3H), 3.75(m, 2H), 6.60(m, 1H), 6.68(s, 1H), 7.29(m, 1H), 7.63(s, 1H), 7.82(d, J=6.0Hz, 2H), 8.71(d, J=6.0Hz, 2H).	365
D016	(CDCl <sub>3</sub> ): 1.95(m, 2H), 2.12(m, 2H), 3.18(m, 2H), 3.55(s, 3H), 3.76(m, 2H), 4.16(m, 1H), 6.67(s, 1H), 7.52(m, 1H), 7.82-7.91(m, 3H), 8.08(d, J=8.3Hz, 1H), 8.70-8.72(m, 3H).	376

D017	(CDCl <sub>3</sub> ): 2.17-2.28(m, 4H), 3.16(m, 2H), 3.31(m, 1H), 3.57(s, 3H), 3.80(m, 2H), 6.70(s, 1H), 6.72(d, J=3.7Hz, 1H), 7.28-7.42(m, 2H), 7.52(d, J=3.7Hz, 1H), 7.60(d, J=7.7Hz, 1H), 7.82(d, J=6.0Hz, 2H), 8.49(d, J=8.1Hz, 1H), 8.72(d, J=6.0Hz, 2H).	414
D018	(CDCl <sub>3</sub> ): 1.83(m, 2H), 1.95-2.18(m, 4H), 2.73(t, J=6.5Hz, 2H), 2.86(m, 2H), 3.13(m, 1H), 3.52(s, 3H), 3.65(m, 2H), 3.82(t, J=6.8Hz, 2H), 6.65(s, 1H), 7.21-7.26(m, 4H), 7.78(d, J=6.0Hz, 2H), 8.69(d, J=6.0Hz, 2H).	430
D019	(CDCl <sub>3</sub> ): 1.98-2.21(m, 4H), 2.76(m, 1H), 3.05(m, 2H), 3.25(t, J=8.3Hz, 2H), 3.55(s, 3H), 3.77(m, 2H), 4.20(t, J=8.3Hz, 2H), 6.68(s, 1H), 7.05(m, 1H), 7.20-7.27(m, 2H), 7.82(d, J=5.9Hz, 2H), 8.26(d, J=8.2Hz, 1H), 8.71(d, J=5.9Hz, 2H).	416
D020	(CDCl <sub>3</sub> ): 1.94-2.18(m, 4H), 2.81-3.08(m, 5H), 3.54(s, 3H), 3.71-3.89(m, 4H), 4.72-4.77(m, 2H), 6.67(s, 1H), 7.19-7.26(m, 4H), 7.81(d, J=6.0Hz, 2H), 8.71(d, J=6.0Hz, 2H).	430
D021	(CDCl <sub>3</sub> ): 2.02-2.09(m, 4H), 3.10(m, 2H), 3.29(m, 1H), 3.54(s, 3H), 3.75(m, 2H), 6.69(s, 1H), 7.01(d, J=3.9Hz, 1H), 7.57(d, J=3.9Hz, 1H), 7.81(d, J=6.2Hz, 2H), 8.71(d, J=6.2Hz, 2H).	415
D022	(CDCl <sub>3</sub> ): 1.98-2.10(m, 4H), 3.16(m, 2H), 3.55(s, 3H), 3.58(m, 1H), 3.76(m, 2H), 6.69(s, 1H), 7.40-7.52(m, 3H), 7.64(d, J=7.8Hz, 2H), 7.73(d, J=8.4Hz, 1H), 7.82(d, J=6.0Hz, 2H), 8.06(d, J=8.4Hz, 2H), 8.72(d, J=6.0Hz, 2H).	451
D023	(CDCl <sub>3</sub> ): 1.57-1.77(m, 4H), 2.30(m, 1H), 2.59(m, 2H), 3.43(s, 3H), 3.49(m, 2H), 6.62(s, 1H), 7.35-7.53(m, 8H), 7.57(m, 1H), 7.74(d, J=5.9Hz, 2H), 8.69(d, J=5.9Hz, 2H).	451
D024	(CDCl <sub>3</sub> ): 1.97-2.12(m, 4H), 3.11(m, 2H), 3.50(m, 1H), 3.54(s, 3H), 3.73(m, 2H), 6.68(s, 1H), 7.51-7.61(m, 3H), 7.80-7.82(m, 3H), 7.92(m, 1H), 8.02(d, J=8.4Hz, 1H), 8.34(d, J=7.5Hz, 1H), 8.71(d, J=6.0Hz, 2H).	425
D025	(CDCl <sub>3</sub> ): 1.89(m, 2H), 2.06(m, 2H), 3.06(m, 2H), 3.51(m, 1H), 3.53(s, 3H), 3.68(m, 2H), 3.94(s, 3H), 6.70(s, 1H), 6.68-6.78(m, 2H), 7.70(dd, J=8.7, 6.9Hz, 1H), 7.81(d, J=6.0Hz, 2H), 8.71(d, J=6.0Hz, 2H).	423

Test Example: Inhibitory activity of the medicament of the present invention against  
P-GS1 phosphorylation by bovine cerebral TPK1

A mixture containing 100 mM MES-sodium hydroxide (pH 6.5), 1 mM  
magnesium acetate, 0.5 mM EGTA, 5 mM  $\beta$ -mercaptoethanol, 0.02% Tween 20, 10%

glycerol, 12  $\mu$ g/ml P-GS1, 41.7  $\mu$ M [ $\gamma$ - $^{32}$ P] ATP (68 kBq/ml), bovine cerebral TPK1 and a compound shown in Table (a final mixture contained 1.7% DMSO deriving from a solution of a test compound prepared in the presence of 10% DMSO) was used as a reaction system. The phosphorylation was started by adding ATP, and the reaction was conducted at 25°C for 2 hours, and then stopped by adding 21% perchloric acid on ice cooling. The reaction mixture was centrifuged at 12,000 rpm for 5 minutes and adsorbed on P81 paper (Whatmann), and then the paper was washed four times with 75 mM phosphoric acid, three times with water and once with acetone. The paper was dried, and the residual radioactivity was measured using a liquid scintillation counter. The results are shown in the table below. The test compound markedly inhibited the P-GS1 phosphorylation by TPK1. The results strongly suggest that the medicaments of the present invention inhibit the TPK1 activity, thereby suppress the A $\beta$  neurotoxicity and the PHF formation, and that the medicaments of the present invention are effective for preventive and/or therapeutic treatment of Alzheimer disease and the above-mentioned diseases.

Table 3

Compound No.	IC <sub>50</sub> (nM)
A001	8.9
A002	27
A003	25
A006	13
B010	6
B037	4.8
B046	8.3
B051	1.9
B054	4
B063	6
B079	3.3
B084	1.1
B085	1.4
B087	5
B088	6
B090	1.1
B091	1.2
B093	0.28
B094	1.2
B097	2.8
B100	4.7
B102	0.62
B103	0.36
B104	10.6
B105	1.6
B106	1.4
B107	50
B108	6.7
B109	7.7
B110	8.2
B112	4.7
B113	4.8
B120	54
B122	63
B128	30
B130	52.9
B140	8
B143	56
B184	8
B185	0.67
B186	1.9
B187	2
B189	5
B220	1.1
B217	70.3
B225	64

B234	30
B235	26.9
B236	11
B238	7.8
B239	17
B240	1.2
B241	0.9
B242	12
B243	0.906
B244	0.3
B245	0.44
B246	27
B247	72
B248	32
B249	10
B251	40
B252	5.2
B253	15
B254	3.9
B255	21
B256	1.1
B257	67
B258	12
B259	4.5
B260	0.76
B261	1.3
B262	1.1
B263	1.2
B264	15
B268	13
B269	1.5
B270	0.79
B271	3.2
B272	0.98
B273	1.9
B274	3.4
B275	2.1
B276	2.5
B277	8.1
B279	1.1
B280	9.3
B281	5.5
B282	17
B283	3.1
B284	9.8
B285	8.9
B286	17
B287	0.57
B288	40
B289	33
B290	2

B291	2
B292	1.5
B293	1.8
B294	1.2
B295	2.7
B296	2.5
B297	23
B298	94
C001	2.1
C002	8.4
C005	45
C006	9
C067	72
C091	23
C092	63
C101	3.5
C102	20.4
C105	45
C106	9
C386	10
C389	34
C390	1.0
D001	9
D002	23
D004	15
D007	18
D009	6
D011	11
D012	19
D013	19
D014	20
D017	10
D018	4.3
D019	8.1
D021	11
D022	7.8
D023	13
D024	19
D025	16

### Formulation Example

#### (1) Tablets

The ingredients below were mixed by an ordinary method and compressed by using a conventional apparatus.

Compound of Example 1

30 mg

Crystalline cellulose	60 mg
Corn starch	100 mg
Lactose	200 mg
Magnesium stearate	4 mg

(2) Soft capsules

The ingredients below were mixed by an ordinary method and filled in soft capsules.

Compound of Example 1	30 mg
Olive oil	300 mg
Lecithin	20 mg

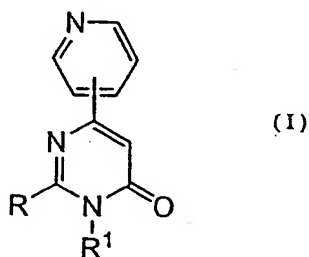
Industrial Applicability

The compounds of the present invention have TPK1 inhibitory activity and are useful as an active ingredient of a medicament for preventive and/or therapeutic treatment of diseases caused by abnormal advance of TPK1 such as neurodegenerative diseases (e.g. Alzheimer disease) and the above-mentioned diseases.



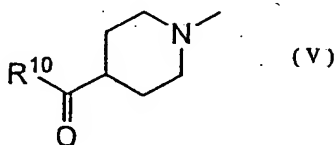
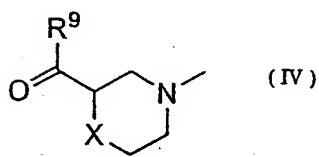
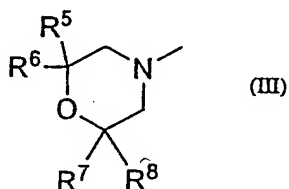
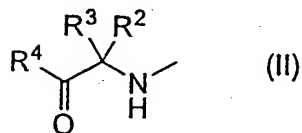
## CLAIMS

1. A pyrimidone derivative represented by formula (I) or a salt thereof, or a solvate thereof or a hydrate thereof:



wherein R<sup>1</sup> represents a C<sub>1</sub>-C<sub>12</sub> alkyl group which may be substituted;

R represents any one of groups represented by the following formulas (II) to (V):



wherein R<sup>2</sup> and R<sup>3</sup> independently represent a hydrogen atom or a C<sub>1</sub>-C<sub>8</sub> alkyl group;

R<sup>4</sup> represents a benzene ring which may be substituted, a naphthalene ring which

may be substituted, an indan ring which may be substituted, a

tetrahydronaphthalene ring which may be substituted, or an optionally substituted

heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of

oxygen atom, sulfur atom and nitrogen atom, and having 5 to 10 ring-constituting atoms in total;

R<sup>5</sup> represents a C<sub>1</sub>-C<sub>8</sub> alkyl group which may be substituted, a C<sub>3</sub>-C<sub>8</sub> cycloalkyl group which may be substituted, a benzene ring which may be substituted, a naphthalene ring which may be substituted, an indan ring which may be substituted, a tetrahydronaphthalene ring which may be substituted, or an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom, and nitrogen atom, and having 5 to 10 ring-constituting atoms in total;

R<sup>6</sup> represents a hydrogen atom, a C<sub>1</sub>-C<sub>8</sub> alkyl group which may be substituted, a benzene ring which may be substituted;

or R<sup>5</sup> and R<sup>6</sup> may bind to each other to form together with the carbon to which R<sup>5</sup> and R<sup>6</sup> are attached an optionally substituted spiro carbocyclic ring having 3 to 11 ring-constituting atoms in total;

R<sup>7</sup> and R<sup>8</sup> independently represent a hydrogen atom or a C<sub>1</sub>-C<sub>8</sub> alkyl group, or R<sup>7</sup> and R<sup>8</sup> may combine to each other to form a C<sub>2</sub>-C<sub>6</sub> alkylene group;

R<sup>9</sup> and R<sup>10</sup> represent a C<sub>1</sub>-C<sub>8</sub> alkyl group which may be substituted, a C<sub>3</sub>-C<sub>8</sub> cycloalkyl group which may be substituted, a benzene ring which may be substituted, a naphthalene ring which may be substituted, an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom, and nitrogen atom, and having 5 to 10 ring-constituting atoms in total, or R<sup>9</sup> and R<sup>10</sup> represent -N(R<sup>11</sup>)(R<sup>12</sup>) wherein R<sup>11</sup> represents a hydrogen atom, a C<sub>1</sub>-C<sub>8</sub> alkyl group; and R<sup>12</sup> represents a C<sub>1</sub>-C<sub>8</sub> alkyl group, a benzene ring which may be substituted, a naphthalene ring which may be substituted, or an optionally substituted heterocyclic ring having 1 to 4 hetero atoms selected from the group consisting of oxygen atom, sulfur atom, and nitrogen atom, and having 5 to 10 ring-constituting atoms in total;

and X represents CH<sub>2</sub>, O or NR<sup>13</sup> wherein R<sup>13</sup> represents a hydrogen atom or a C<sub>1</sub>-C<sub>8</sub> alkyl group.

2. The pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof according to claim 1, wherein R<sup>1</sup> is methyl group.

3. The pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof according to claim 1 or 2, wherein R is the group represented by formula (II).

4. The pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof according to claim 3, wherein each of R<sup>2</sup> and R<sup>3</sup> is hydrogen atom.

5. A pyrimidone derivative which is selected from the group consisting of:  
3-methyl-2-(2-oxo-2-phenylethylamino)-6-pyridin-4-yl-3H-pyrimidin-4-one;  
3-methyl-2-(2-oxo-2-(3-fluorophenyl)ethylamino)-6-pyridin-4-yl-3H-pyrimidin-4-one;  
3-methyl-2-(2-oxo-2-(4-fluorophenyl)ethylamino)-6-pyridin-4-yl-3H-pyrimidin-4-one;  
3-methyl-2-(2-oxo-2-(3-chlorophenyl)ethylamino)-6-pyridin-4-yl-3H-pyrimidin-4-one;  
3-methyl-2-(2-oxo-2-(3-methylphenyl)ethylamino)-6-pyridin-4-yl-3H-pyrimidin-4-one;  
or a salt thereof, or a solvate thereof or a hydrate thereof.

6. The pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof according to claim 1 or 2, wherein R is the group represented by formula (III).

7. The pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof according to claim 6, wherein R<sup>6</sup> is hydrogen atom.

8. The pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof according to claim 7, wherein each of R<sup>7</sup> and R<sup>8</sup> is hydrogen atom.

9. The pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof according to claim 7, wherein each of R<sup>7</sup> and R<sup>8</sup> is methyl group.

10. A pyrimidone derivative which is selected from the group consisting of:  
2-[2-(4-Fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(4-Fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(2-Fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
(S)-2-[2-(2-Fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(4-Chlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(3-Chlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(2-Chlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
(S)-2-[2-(2-Chlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(4-Bromophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
(S)-2-[2-(4-Bromophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(3-Bromophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
(S)-2-[2-(3-Bromophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(2-Bromophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(4-Methylphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(3-Methylphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(2-Methylphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
(S)-2-[2-(2-Methylphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(4-Cyanophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(3-Cyanophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
(S)-2-[2-(3-Cyanophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(2-Cyanophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(4-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
(S)-2-[2-(4-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(3-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
(S)-2-[2-(3-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(2-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2-Methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2-Ethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2-Trifluoromethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(5-Fluoro-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(4-Fluoro-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(4-Fluoro-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,5-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,5-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2-Chloro-4,5-difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2-Chloro-4,5-difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2-Bromo-4-fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,4-Difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,4-Difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,6-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,6-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

pyrimidin-4-one;

2-[2-(2,4-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,4-Dimethoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,6-Dichlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,6-Dichlorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,6-Difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,6-Difluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2-Chloro-6-fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2-Chloro-6-fluorophenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(4-Fluoro-3-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(5-Cyano-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(5-Cyano-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(4-Cyano-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(4-Cyano-2-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,4-Difluoro-6-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,4-Difluoro-6-methoxyphenyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(4-(Pyrrolidin-1-yl-methyl)phenyl)morpholino-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(4-(Pyrrolidin-1-yl-methyl)phenyl)morpholino-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(1-Naphthyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2-Naphthyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2-Naphthyl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(2,3-Dihydrobenzofuran-7-yl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

(S)-2-[2-(2,3-Dihydrobenzofuran-7-yl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;

2-[2-(Benzofuran-2-yl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
and

(S)-2-[2-(Benzofuran-2-yl)morpholin-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one  
or a salt thereof, or a solvate thereof or a hydrate thereof.

11. The pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof according to claim 1 or 2, wherein R is the group represented by formula (IV).

12. The pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof according to claim 11, wherein R<sup>9</sup> is a benzene ring which may be substituted.

13. The pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof according to claim 11, wherein X is CH<sub>2</sub>.

14. The pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof according to claim 11, wherein X is O.

15. A pyrimidone derivative which is selected from the group consisting of:

2-[3-(4-Fluorobenzoyl)piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-(3-Benzoylpiperidin-1-yl)-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[3-(2-Methoxybenzoyl)piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[3-(4-Methoxybenzoyl)piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(4-Fluorobenzoyl)morpholine-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-(2-Benzoylmorpholine-4-yl)-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(2-Methoxybenzoyl)morpholine-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[2-(4-Methoxybenzoyl)morpholine-4-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
or a salt thereof, or a solvate thereof or a hydrate thereof.

16. The pyrimidone derivative or the salt thereof, or the solvate thereof or the hydrate thereof according to claim 1 or 2, wherein R is the group represented by formula (V).

17. The pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof according to claim 16, wherein R<sup>10</sup> is a benzene ring which may be substituted.

18. The pyrimidone derivative or the salts thereof, or the solvate thereof or the hydrate thereof according to claim 16, wherein R<sup>10</sup> is a heterocyclic ring having 1 to 4 hetero atoms selected oxygen atom, sulfur atom and nitrogen atom, and having total ring-constituting atoms of 5 to 10 which may be substituted.

19. A pyrimidone derivative which is selected from the group consisting of:

2-[4-(4-Chlorobenzoyl)piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one;  
2-[4-(3,4-Dihydro-2H-quinoline-1-carbonyl)-piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one; and  
2-[4-(2,3-Dihydroindole-1-carbonyl)-piperidin-1-yl]-3-methyl-6-pyridin-4-yl-3H-pyrimidin-4-one,

or a salt thereof, or a solvate thereof or a hydrate thereof.



20. A medicament comprising as an active ingredient a substance selected from the group consisting of the pyrimidone derivative represented by formula (I) and a salt thereof, and a solvate thereof and a hydrate thereof according to claim 1.

21. A tau protein kinase 1 inhibitor selected from the group consisting of the pyrimidone derivative represented by formula (I) and a salt thereof, and a solvate thereof and a hydrate thereof according to claim 1.

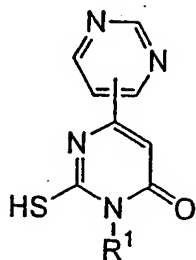
22. The medicament according to claim 20 which is used for preventive and/or therapeutic treatment of a disease caused by tau protein kinase 1 hyperactivity.

23. The medicament according to claim 20 which is used for preventive and/or therapeutic treatment of a neurodegenerative disease.

24. The medicament according to claim 23, wherein the disease is selected from the group consisting of Alzheimer disease, ischemic cerebrovascular accidents, Down syndrome, cerebral bleeding due to cerebral amyloid angiopathy, progressive supranuclear palsy, subacute sclerosing panencephalitic parkinsonism, postencephalitic parkinsonism, pugilistic encephalitis, Guam parkinsonism-dementia complex, Lewy body disease, Pick's disease, corticobasal degeneration, frontotemporal dementia, vascular dementia, traumatic injuries, brain and spinal cord trauma, peripheral neuropathies, retinopathies and glaucoma.

25. The medicament according to claim 20, wherein the disease is selected from the group consisting of non-insulin dependent diabetes, obesity, manic depressive illness, schizophrenia, alopecia, breast cancer, non-small cell lung carcinoma, thyroid cancer, T or B-cell leukemia, and a virus-induced tumor.

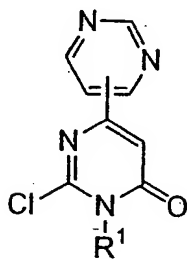
26. A pyrimidone derivative represented by formula (VI) or a salt thereof, or a solvate thereof or a hydrate thereof:



(VI)

wherein R<sup>1</sup> represents a C<sub>1</sub>-C<sub>12</sub> alkyl group which may be substituted.

27. A pyrimidone derivative represented by formula (VII) or a salt thereof, or a solvate thereof or a hydrate thereof:



(VII)

wherein R<sup>1</sup> represents a C<sub>1</sub>-C<sub>12</sub> alkyl group which may be substituted.

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07D401/04 C07D401/14 C07D413/14 A61K31/505 A61P25/28

☐ to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07D A61K A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

CHEM ABS Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 00 18758 A (MITSUBISHI) 6 April 2000 (2000-04-06) claims; figure 439; example 142; table 1	1, 10, 20-25
A	WO 98 24782 A (AMGEN) 11 June 1998 (1998-06-11) cited in the application page 0; claims	1, 20-25
A	CHEMICAL ABSTRACTS, vol. 84, no. 7, 1976 Columbus, Ohio, US; abstract no. 44112b, page 502; XP002127060 abstract & JP 07 435631 A (KOWA) 25 September 1974 (1974-09-25)	1, 10, 20
-/-		

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
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- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search

12 November 2002

Date of mailing of the international search report

21/11/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

Francois, J

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, A	EP 1 136 482 A (SANOFI-SYNTHELABO) 26 September 2001 (2001-09-26) claims; table 1	1, 20

# INTERNATIONAL ARCH REPORT

Information on patent family members

International Application No

PCT/JP 02/09685

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